Ontario Animal

Research and Services Committee

(O.A.R.S.C)

2002 Annual Report

to

Ontario Agricultural Services

Coordinating Committee

November 2002

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Ontario Animal Research and Services Committee (OARSC) Report
2002

Introduction:

The focus of this year's OARSC and twelve subcommittee meetings was to identify and prioritize technology transfer priorities. Eleven of the twelve subcommittees met and submitted reports this year with the Furbearing Committee electing to allow last year's report to reflect current priorities.

To aid the committee's work, OARSC agreed upon a common definition of technology transfer as: the dissemination of information to facilitate the efficient and timely adoption of beneficial technologies and management practices on Ontario livestock and poultry farms.

In September, a one-half day meeting was held where a cross-section of organizations outlined their mandates and resources devoted to technology transfer. Presentations were provided by industry commodity groups, the College of Veterinarians of Ontario (CVO), the Equine Research Centre (ERC), the University of Guelph, the Ontario Ministry of Agriculture and Food (OMAF), feed industry and Dairy Herd Improvement (DHI). Speakers and participants were challenged to identify factors contributing to success, target audiences, opportunities, priorities and barriers. This meeting again proved to be very useful as a basis for further commodity-specific discussions at the subcommittee level.

OARSC met for its annual meeting on October 30, 2002. In addition to subcommittee reports, presentations were made to provide the highlights of the new OMAF-University of Guelph agreement and to describe the re-organization of Agriculture and Agri-Food Canada, particularly with respect to the Agricultural Policy Framework (APF).

Industry Scan:

The *Nutrient Management Act* received 3rd reading in the legislature and will be proclaimed once regulations come into effect. Two phases of proposed regulations have now been released for public consultation and an additional phase is currently in development. Over a five-year phase in period, the Act and Regulations will ultimately regulate the storage and application of all nutrient-containing materials on agricultural lands in Ontario. The agriculture sector is expecting regulations to be science based and as simple as possible to understand and implement with costs being shared by society. The livestock industries continue to be actively involved in estimating the impact of this new legislation and proposing modifications to the draft regulations. It is anticipated that provincial standards will help to level the playing field, replacing the existing patchwork of municipal standards and by-laws.

The *Food Safety and Quality Act* also received 3rd reading and, once proclaimed, will allow for the consolidation and modernization of provincial food safety legislation. Meat inspection and dead animal disposal regulations are currently in development.

Following a Supreme Court of Canada ruling, new provincial legislation has been introduced to allow agricultural labour the right to associate. However, the legislation as currently written protects the farming sector from labour disruptions that could threaten livestock and crop production and harvest.

A new five year, $50.5 M/year contract has been signed between OMAF and the University of Guelph. The contract applies to research, education and laboratory services provided at the University main campus, research stations and four College locations. OMAF funds will no longer support beef or dairy research at Ridgetown College. Sheep research is being consolidated at the University of Guelph and the New Liskeard sheep flock has been donated to the Ontario Sheep Marketing Agency. Agricultural diploma education has been consolidated at the Kemptville and Ridgetown College sites with the majority of the agricultural and horticultural diploma programs being moved away from the Guelph campus location.

All four Canadian Veterinary Colleges received federal infrastructure funding in 2002 for capital improvements required to meet current and future education, teaching and service requirements. The Ontario Veterinary College received $36.2M in funds to upgrade their facilities. Matching resources from provincial and private sources are now being sought.

Over the next five years, a number of issues are expected to impact the Ontario livestock sectors including:

- U.S. Country of Origin Labelling
- Agricultural Policy Framework
- Animal Identification and agri-food system traceability
- Use of antibiotics in livestock production
- Medicated feeds mixing regulations
- On-farm HACCP based food safety programs
- WTO negotiations and trade challenges
- Animal welfare legislation
- Endangered species legislation

Successful Technology Transfer:

The OARSC committees concluded that successful technology transfer is reliant on addressing four major challenges:

- Defining the target audience
- Presenting the information in a useful and practical form
- Credibility and trustworthiness of individuals and organizations involved
- Defining technology transfer objectives and measuring performance

Common themes emerging from the discussion included:

- **OMAF is a major and critical player involved in technology transfer**

While the mandate and organizational structure of OMAF has changed dramatically over the past ten years, the Ministry remains the core strength for agricultural technology transfer in the province. Increasingly though, OMAF experts rely on information dissemination through 3rd parties rather than direct delivery by an extensive field service. The role of OMAF in providing unbiased advice is regarded as essential.

- **Many commodity organizations have a very focused mandate for technology transfer**

Commodity organizations are increasingly involved in technology transfer to their members but few organizations feel they are adequately resourced to deal with a broad technology transfer mandate. By nature, industry organizations tend to respond to the immediate issues of the day rather than provide a general technology knowledge base for the industry. Service organizations, such as Dairy Herd Improvement, have successfully incorporated a technology transfer mandate which provides added value to their core services.

- **Agri-business can serve as valuable partners in technology transfer initiatives**

Through their extensive network of dealerships and regular presence on farms, agri-business can serve a very useful role in technology transfer. However, agri-business is most interested in transferring knowledge related to the purchase of their products or services and has limited interest in the transfer of general technical information.

- **Veterinarians are a trusted source of information**

To varying degrees, veterinarians have assumed a role in technology transfer. This role is expected to increase, particularly with the implementation of on-farm food safety programs and expected increased restrictions on the agricultural use of antibiotics.

- **The University's mandate in technology transfer is primarily the publication of scientific peer-reviewed papers**

- **Print publications, workshops and management clubs remain the most successful methods of information dissemination to farmers**

- **Electronic means of information dissemination are increasing**

E-mail lists and websites are increasingly being used for information dissemination;

however, the slow speed of internet access in many rural communities remains a major barrier. For specific targeted audiences, for example agribusiness, government, academia and the horse sector, web-based information dissemination and e-mail lists are very effective and inexpensive.

- **Increasingly, partnerships are involved in successful technology transfer initiatives**

Co-ordination of resources and effective communications are key to successful partnerships in technology transfer. Successful initiatives have utilized a variety of models including multiple commodity organizations, university-government-industry and government-government partnerships.

- **Agricultural awareness and information dissemination to the public remains a very large issue**

Lack of public awareness about livestock agriculture and misinformation in the media are large and growing issues. However, it is unclear whose mandate it is to address public awareness issues on an ongoing and proactive basis.

Technology Transfer Priorities:

- **Environment:**
  - Nutrient management plans
  - On-farm disposal of livestock mortalities
  - Greenhouse gas reduction
  - Restricting access of livestock to surface water
  - Innovative nutrient management, application and storage technologies
  - Regulatory compliance strategies
  - Nutrition and environment

- **Quality Assurance**
  - Animal handling and transportation
  - Production systems for niche markets

- **Animal Health and Food Safety**
  - Biosecurity
  - Animal identification
  - On-farm mixing of medicated feeds
  - Responsible use of livestock medicines
  - Drug residues

- **Production Efficiency**
  - Cost of production
  - Return on investment
  - Conception rates and reproduction
  - Nutrition and feed costs
  - Breeding and Genetics
  - Predator control
  - Production models

- **Animal Housing**
  - Facilities design
  - Animal comfort
  - Alternative housing systems

- **Financial Management**
  - Options and support for exiting producers
  - Support for beginning/new farmers
  - Forward contracting
  - Financial records
  - Access to capital

- **Livestock Production and Human Health**
  - Zoonotic diseases
  - Worker health and safety

The assistance provided to OARSC throughout the year by Katherine Hoffman, OMAF Animal Program Research Analyst and Shannon Bradbury and Jean Haws, OMAF Administrative Assistants is gratefully acknowledged.

Gwen McBride
Chair, Ontario Animal Research and Services Committee

General Statistics For The Ontario Livestock Industry

The tables that follow show:

1. Average Price to the Producer – Ontario
2. Farm Cash Receipts by Province
3. Farm Cash Receipts From Farming Operations In Ontario
4. Ontario and Canada Agri-Food Trade – January to December
5. Number of Livestock Slaughtered in Commercial Establishments
6. The Size of the Ontario Livestock and Poultry Industry
7. Per Capita Consumption of Selected Foods

Detailed information on the state of the industry for each species/commodity is included in each subcommittee report.

Table 1 – Average Price to the Producer, Ontario

	1992	1994	1995	1996	1997	1998	1999	2000	2001
Slaughter steers, $/cwt	85.65	94.24	80.64	75.88	80.93	81.08	90.92	101.2	109.2
Slaughter lambs, $/cwt	97.99	116.60	130.62	138.22	142.9	133.6	127.4	130.2	129.4
Hogs, index 100, $/100 kg	132.00	145.00	151.00	189.00	187.00	121.00	120.00	161.00	182.00
Chickens, $/kg	1.51	1.44	1.41	1.61	1.6	1.57	1.44	1.50	1.62
Turkeys, $/kg	1.60	1.66	1.67	1.85	1.81	1.78	1.71	1.72	1.75
Eggs, $/doz	1.04	1.12	1.17	1.31	1.24	1.20	1.19	1.24	1.30
Milk, $/hl	-	52.05	51.82	51.8	51.47	56.42	51.74	53.90	54.19

Source: Statistics Canada

Table 2 – Total Farm Cash Receipts by Province, ($'00)

	1999	**2000**	**2001**
Newfoundland	77,463	72,659	81,938
Prince Edward Island	347,012	321,412	336,368
Nova Scotia	392,905	414,157	420,890
New Brunswick	373,903	365,357	411,493
Quebec	5,129,981	5,438,834	5,688,651
Ontario	**7,220,850**	**7,906,940**	**8,488,286**
Manitoba	2,959,104	3,174,403	3,688,725
Saskatchewan	5,532,680	5,716,879	6,567,201
Alberta	6,481,724	7,518,790	8,298,726
British Columbia	1,935,468	2,079,043	2,213,947
Canada	**30,451,090**	**33,008,474**	**36,196,220**

Source: Statistics Canada, Catalogue No. 21-603

Table 3 – Farm Cash Receipts from Farming Operations, Ontario 1994 – 2001 ($'000)

Item	1994	1995	1996	1997	1998	1999	2000	2001
Wheat	136,986	163,754	159,802	73,734	120,266	106,517	111,811	102,508
Oats	5,557	6,501	5,371	5,201	4,847	4,244	3,043	4,389
Barley	10,805	11,998	14,463	11,612	10,148	7,899	7,068	8,979
Rye	4,132	4,095	5,845	5,410	5,025	4,570	3,650	4,585
Canola	14,689	21,070	12,314	17,507	17,868	8,896	10,066	8,276
Soybeans	470,895	590,909	558,461	726,560	688,921	525,817	586,477	447,430
Corn	333,102	474,347	509,535	435,216	385,059	458,786	408,395	376,959
Potatoes	58,858	53,794	48,956	57,625	54,774	62,555	65,590	71,935
Vegetables	415,626	432,407	443,796	464,211	571,234	598,847	629,248	682,966
Apples	55,120	73,878	80,352	90,951	88,655	96,500	98,541	88,133
Other tree fruits	48,322	49,953	36,355	42,822	44,980	49,628	45,437	46,557
Strawberries	27,461	28,381	14,073	17,351	17,431	17,360	17,300	17,500
Other berries, grapes	32,536	37,775	39,458	46,114	51,569	58,985	53,703	59,661
Floriculture and nursery	418,499	445,287	469,508	505,264	577,397	664,640	826,336	856,877
Tobacco	344,925	270,402	323,630	331,873	342,307	338,960	344,873	244,454
Ginseng	47,840	47,300	51,612	39,897	36,851	22,906	24,856	37,551
Dry beans	48,949	63,723	36,057	28,640	31,399	41,942	29,631	18,530
Forage and grass seed	1,872	1,601	1,620	1,824	1,739	1,426	1,693	1,821
Hay and clover	14,735	21,520	25,407	30,314	27,478	25,315	26,744	28,900
Maple products	9,261	9,897	14,807	10,108	8,125	10,538	17,540	10,666
Forest products	18,101	19,718	20,787	20,977	19,849	21,563	19,655	19,347
Christmas trees	..	..	..	11,700	6,078	6,078	6,078	6,078
Miscellaneous crops	17,628	16,971	14,361	14,874	15,561	15,671	16,690	15,721
Total crops	**2,535,899**	**2,845,281**	**2,886,570**	**2,989,785**	**3,127,561**	**3,149,643**	**3,354,425**	**3,159,825**

Table 3 – Farm Cash Receipts from Farming Operations, Ontario 1994 – 2001 ($'000)

Item	1994	1995	1996	1997	1998	1999	2000	2001
Cattle	822,827	760,398	781,670	781,861	850,900	907,070	979,652	1,126,077
Calves	114,122	86,300	71,115	87,462	80,104	87,721	89,626	96,744
Hogs	535,301	587,417	744,165	782,718	589,661	601,127	829,372	954,995
Sheep	1,705	1,983	1,870	2,190	2,590	2,391	3,069	3,217
Lambs	19,773	21,485	24,079	22,539	21,689	22,361	25,306	34,261
Dairy products	1,155,183	1,169,532	1,185,680	1,234,543	1,277,740	1,280,810	1,319,954	1,369,058
Hens and chickens	358,065	341,455	406,237	417,679	443,754	424,465	439,190	491,060
Turkeys	96,746	101,082	121,256	118,171	110,422	101,985	115,172	114,944
Hatcheries	..	..	..	12,459	14,212	10,564	10,530	10,845
Eggs	199,939	211,158	236,895	191,847	182,292	188,335	197,134	220,580
Wool	279	628	374	363	264	166	217	239
Honey	8,752	8,182	9,417	9,284	8,906	8,738	8,443	8,984
Furs	11,474	10,264	18,983	13,597	13,068	8,589	10,676	10,730
Miscellaneous livestock	73,590	72,991	72,379	73,873	72,280	73,291	80,973	89,242
Total livestock and products [a]	**3,418,527**	**3,390,719**	**3,691,311**	**3,767,464**	**3,686,280**	**3,737,876**	**4,129,689**	**4,551,286**
NISA	9,217	11,593	30,295	34,318	76,002	109,107	109,730	122,008
GRIP (revenue protection)	17,766	-199	563	-	-	-	-	-
Crop insurance	38,015	25,818	58,096	47,154	51,329	28,644	71,749	218,699
Price stabilization	5	2	-	-	-	-	-	-
Tripartite payments	7,728	725	14	-29	-3	-5	-4	-4
Provincial stabilization	409	-	-	-	-	-	-	-
Dairy subsidy	69,107	65,258	53,742	53,284	47,364	36,487	25,934	14,704
Market Revenue Program	-	-	-	-	15,070	74,844	127,243	121,853
Ontario Whole Farm Relief Program	-	-	-	-	-	78,277	87,343	52,981
	-	-	-	-	-	-	-	56,255
Other payments	1,162	8,210	1,122	1,860	11,279	5,777	831	190,679
Total payments	**143,409**	**111,407**	**143,832**	**136,587**	**201,041**	**333,331**	**422,826**	**777,175**
Total receipts	**3,563,930**	**3,504,121**	**3,837,139**	**3,906,048**	**3,889,319**	**4,073,206**	**7,906,940**	**8,488,286**

Table 3 – Farm Cash Receipts from Farming Operations, Ontario 1994 – 2001 ($'000)

Income of Farm Operators from Farming Operations, 1993-2001($'000)

Item	1994	1995	1996	1997	1998	1999	2000	2001
+ Total farm cash receipts	6,097,835	6,347,407	6,721,713	6,893,836	7,014,882	7,220,850	7,906,940	8,488,286
- Operating expenses after rebates	5,050,713	5,186,576	5,447,192	5,583,631	5,752,547	5,927,692	6,327,259	6,675,107
= Net cash income	1,047,122	1,160,831	1,274,521	1,310,205	1,262,335	1,293,158	1,579,681	1,813,179
+ Income-in-kind	48,054	45,997	47,782	48,687	45,943	49,742	46,874	47,008
- Depreciation	750,179	783,309	836,782	863,182	914,298	929,854	960,072	969,781
= Realized net income	344,997	423,519	485,521	495,710	393,980	413,046	666,483	890,406
+ Value of inventory change	131,107	14,934	135,993	664	22,878	(17,132)	(228,838)	(112,978)
= Total net income	476,104	438,453	621,514	496,374	416,858	395,914	437,645	777,428

Table 4 - Ontario and Canada Agri-Food Trade, January-December 1999/00/01 (Cdn $'000)

Commodity group	ex99 Ont	ex99 Can	im99 Ont	im99 Can	ex00 Ont	ex00 Can	im00 Ont	im00 Can	ex01 Ont	ex01 Can	im01 Ont	im01 Can
Live animals	365,564	1,537,153	75,146	234,216	407,486	1,702,394	90,377	343,073	579,004	2,349,095	79,678	321,904
Red meats	555,216	3,067,634	623,477	1,059,621	634,891	3,778,329	671,640	1,155,862	777,212	4,552,776	746,450	1,348,073
Fish and products	120,971	3,746,508	564,433	2,011,360	119,216	4,066,700	576,353	2,085,230	124,848	4,208,320	596,212	2,145,227
Poultry and eggs	109,101	187,147	326,588	428,282	120,818	215,234	345,418	445,226	141,756	271,639	408,230	531,408
Dairy products	116,306	364,719	209,173	352,749	82,102	281,735	268,016	450,337	156,066	417,985	334,102	525,691
Other animal products	291,823	629,060	230,420	347,536	314,555	644,814	219,028	341,383	331,473	719,899	255,769	366,342
Grains	111,190	3,958,598	165,735	317,284	42,774	4,298,700	213,599	374,493	55,594	4,542,165	333,889	610,910
Grain products	969,515	1,536,578	745,257	1,187,696	1,044,135	1,685,578	810,057	1,268,051	1,159,617	1,934,587	919,137	1,404,869
Oilseeds	134,824	1,873,179	204,686	299,825	118,302	1,705,607	207,222	294,422	126,406	1,802,760	303,356	419,720
Oilseed products	225,950	970,960	278,645	593,404	173,508	778,511	294,125	681,162	191,529	773,554	325,756	742,687
Animal feeds	333,111	749,927	433,705	624,454	316,865	777,915	450,384	653,275	347,145	881,364	454,085	701,252
Fruit and nuts	91,000	374,199	1,571,503	2,890,797	94,950	398,068	1,572,109	2,910,290	86,994	436,764	1,655,040	3,051,021
Vegetables	500,688	2,144,810	1,087,904	1,956,571	548,038	2,395,187	1,170,429	2,100,411	575,109	1,847,399	1,295,796	2,274,327
Seeds for sowing	36,855	233,395	130,996	197,028	37,538	222,709	155,750	225,031	24,726	201,827	169,555	237,845
Vegetable fibres	1,866	35,296	69,691	146,657	1,447	32,111	101,343	179,574	6,445	34,238	98,251	177,035
Floriculture and nursery products	239,029	655,707	168,242	303,595	271,470	723,510	180,859	319,700	306,681	800,529	197,787	349,589
Tropical products (excl. fruit)	384,766	555,663	857,046	1,509,073	418,774	586,264	803,801	1,414,814	473,546	674,436	769,550	1,357,935
Sugar and confectionery	434,957	711,855	573,674	979,324	490,912	813,216	663,944	1,039,708	599,723	1,001,934	763,656	1,214,195
Other edible preparations	432,354	698,753	794,445	1,134,290	421,467	701,446	842,779	1,199,921	531,283	897,254	916,166	1,298,846

Beverages	990,527	1,459,290	773,863	1,719,767	1,003,024	1,446,097	813,111	1,817,511	1,063,582	1,532,343	902,353	2,007,925
Tobacco and products	115,153	168,999	44,742	74,348	97,513	141,294	51,060	81,864	126,862	178,451	45,582	84,675
Other agri-food products	29,530	56,280	75,126	142,154	33,487	54,105	82,585	146,564	47,020	83,390	87,819	156,885
Total	**6,590,298**	**25,715,710**	**10,004,497**	**18,510,033**	**6,793,272**	**27,449,525**	**10,583,991**	**19,527,902**	**7,832,620**	**30,142,708**	**11,658,219**	**21,328,361**

Source: Statistics Canada, International Trade Division.

Table 5 - Number of Livestock Slaughtered in Commercial Establishments[a]

Canada and the Provinces, 1998 - 2001

	Cattle & Calves				Hogs				Sheep and Lambs			
Province	1998	1999	2000	2001	1998	1999	2000	2001	1998	1999	2000	2001
	- '000 head -											
Nfld	2.5	1.9	2	2	6.1	6.8	5.8	4.8	3.4	3.5	3	3.7
PEI	35	28.6	28	26.8	195.9	204.7	195	208.6	1	0.9	0.6	0.4
NS	33.3	30.5	30.1	27.8	232.8	233.4	221.3	224.7	12.2	12.4	12.3	12.1
NB	27.6	24.5	20.6	19.7	173.6	181.9	202.9	228.6	1.9	2.0	2.5	2.9
Quebec	472.5	474.5	458.1	474.3	6,252.3	6,740.8	6,828.7	7,061.2	91.0	97.7	123.3	146.1
Ontario	761.5	753.6	707.0	657.5	4,011.7	4,732.5	4,821.7	5,015.9	225.6	251.8	265.4	284.1
Manitoba	36.3	39.7	39.4	48.2	2,307.2	2,474.2	2,790.7	3,156.1	14.3	20.5	18.4	23.5
Saskatchewan	357.8	331.5	292.1	240.0	1,351.7	1,493.9	1,524.0	1,622.4	18.7	22.4	23.2	25.1
Alberta	1,974.6	2,199.5	2,210.6	2,270.3	2,120.0	2,549.7	2,809.2	2,916.7	71.2	72.2	80.9	92.5
British Columbia	54.1	51.0	48.2	50.0	291.2	303.2	285.1	258.3	58.7	67.3	82.2	83.7
Canada	**3,755.2**	**3,935.3**	**3,836.1**	**3,816.6**	**16,942.5**	**18,921.1**	**19,684.4**	**20,697.3**	**498.0**	**550.7**	**611.8**	**674.1**

[a] Includes federally and provincially inspected slaughterings as well as farm kill.

Source: Statistics Canada, Catalogue No.23-603

Table 6 - The Size of the Ontario Livestock and Poultry Industry

Industry	Ontario number of head				% change			Numbers in Canada			Current	Current %	#1 Province
	July 1,1999	July 1,2000	July 1,2001	July 1,2002	00/99	00/01	01/02	2000	2001	2002	Rank	of Canada	in 2000
	'000 head	*'000 head*			*%*			*'000 head*			*#*	*%*	
Bulls(>1 yr.)	26.0	26.0	25.0	25.0	0.0	-3.8	0.0	258.9	265.2	259.5	4	9.6	Alberta
Dairy cows	385.0	377.0	365.0	367.0	-2.1	-3.2	0.5	1,087.7	1,072.7	1,072.4	2	34.2	Quebec
Dairy heifers(>1 yr.)	182.0	184.0	197.0	199.5	1.1	7.1	1.3	494.1	517.2	517.9	1	38.5	Ontario
Beef cows	408.0	387.0	378.0	373.0	-5.1	-2.3	-1.3	4,710.6	4,799.3	4,751.8	4	7.8	Alberta
Beef Heifers for breeding(>1 yr.)	75.0	71.0	82.0	74.5	-5.3	15.5	-9.1	836.6	858.5	826.0	4	9.0	Alberta
Beef heifers for slaughter(>1 yr.)	149.0	180.0	162.0	167.0	20.8	-10.0	3.1	1,065.6	1,059.7	1,112.8	2	15.0	Alberta
Steers(>1 yr.)	285.0	306.0	315.0	339.0	7.4	2.9	7.6	1,580.2	1,658.5	1,598.6	2	21.2	Alberta
Calves(<1 yr.)	610.0	566.0	606.0	595.0	-7.2	7.1	-1.8	4,934.7	5,193.4	5,138.2	3	11.6	Alberta
Total Cattle & Claves	2,120.0	2,097.0	2,130.0	2,140.0	-1.1	1.6	0.5	14,968.4	15,424.5	15,277.2	3	14.0	Alberta
Sows & Bred Gilts	334.1	341.5	351.0	369.8	2.2	2.8	5.4	1,282.6	1,334.7	1,485.7	2	24.9	Quebec
Boars, 6 months & over	14.0	13.7	13.2	12.9	-2.1	-3.6	-2.3	48.7	47.8	44.4	1	29.1	Ontario
Other Pigs under 20kg	1,040.6	1,033.7	1,048.2	1059.4	-0.7	1.4	1.1	3,711.6	3,692.2	4,267.5	2	24.8	Quebec
Other Pigs, 20-60 kg	1,100.0	1,167.2	1,099.7	1141.4	6.1	-5.8	3.8	3,693.2	3,685.4	4,597.2	2	24.8	Quebec
Other Pigs, over 60 kg	892.6	959.8	964.1	1006.5	7.5	0.4	4.4	3,564.9	3,572.1	4,199.3	2	24.0	Quebec
Total Pigs	3,381.3	3,515.9	3,476.2	3,590.0	4.0	-1.1	3.3	12,301.0	12,332.2	14,594.1	2	24.6	Quebec
Sheep(> 1yr.)	161.4	179.7	188.7	183.2	11.3	5.0	-2.9	585.4	651.3	667.6	1	27.4	Ontario
Lambs	113.6	132.3	151.3	151.8	16.5	14.4	0.3	519.9	596.4	584.9	1	26.0	Ontario
Total sheep & lambs	275.0	312.0	340.0	335.0	13.5	9.0	-1.5	1105.3	1247.7	1252.5	1	26.7	Ontario
Layers	8,950.0	8,895.0	9,276.0	9,565.0	-0.6	4.3	3.1	24,901.0	25,262.0	26,213.0	1	36.5	Ontario
Broilers	20,924.0	21,859.0	22,802.0	23,167.0	4.5	4.3	1.6	72,185.0	75,089.0	74,556.0	1	31.1	Ontario
Turkeys	2,808.0	2,888.0	2,920.0	2,730.0	2.8	1.1	-6.5	7,704.0	7,470.0	7,020.0	1	38.9	Ontario

Source: Statistics Canada

Table 7 - Per Capita Consumption of Selected Foods, Canada, 1991-2001

Red Meats, Poultry Meat and Eggs

Type	Units	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Beef:												
- Carcass weight basis	kg	33.3	32.4	31.1	31.7	31.7	31.4	31.4	31.8	32.5	32.0	30.7
- Retail weight basis	kg	24.3	23.6	22.7	23.1	23.2	22.9	22.9	23.3	23.7	23.4	22.4
Veal [a]	kg	1.5	1.5	1.4	1.3	1.4	1.3	1.4	1.3	1.3	1.3	1.2
Mutton and lamb [a]	kg	0.9	0.8	0.9	0.8	0.8	0.8	0.7	0.8	0.8	0.9	1.0
Pork:												
- Carcass weight basis	kg	25.9	28.4	27.6	28.4	27.8	25.9	25.4	28.6	30.1	28.6	28.9
- Retail weight basis	kg	19.7	21.6	21.0	21.6	21.1	19.7	19.3	21.7	22.9	21.8	22.0
Offal	kg	1.7	1.5	1.1	1.5	1.4	1.3	1.2	1.4	1.7	1.0	1.1
Total red meats [a]	**kg**	**63.2**	**64.5**	**62.0**	**63.7**	**63.0**	**60.7**	**60.0**	**63.9**	**66.4**	**63.8**	**62.9**
Stewing hen and chicken	kg	23.8	24.3	24.8	26.4	26.2	26.6	27.5	28.2	29.6	30.9	32.0
Turkey	kg	4.5	4.6	4.4	4.4	4.3	4.1	4.2	4.3	4.2	4.3	4.2
Total poultry meats [b]	**kg**	**28.3**	**28.8**	**29.1**	**30.8**	**30.5**	**30.7**	**31.7**	**32.5**	**33.8**	**35.2**	**36.2**
Eggs	dozens	15.0	14.6	14.5	14.5	14.4	15.0	15.1	15.2	15.3	15.7	16.0

a Carcass weight basis.
b Eviscerated weight. Excludes goose and duck meat.
Sources: Statistics Canada, Catalogue No. 32-229, and 32-230.

Dairy Products and Margarine

Type	Units	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Cottage cheese	kg	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7
Creamery butter	kg	3.0	2.8	2.9	2.9	2.8	2.9	2.6	2.9	2.8	2.7	2.7
Skim milk powder	kg	1.1	1.1	1.1	1.1	0.9	1.3	1.0	1.3	1.5	1.1	1.6
Whey powder	kg	0.9	0.8	1.0	1.0	0.9	1.1	0.8	0.7	0.4	0.9	0.8
Evaporated milk	L	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0
Cheddar cheese as such [a]	kg	3.1	3.1	3.0	3.2	3.2	3.1	3.2	3.2	3.3	3.2	3.0
Process cheese	kg	2.8	2.8	2.7	2.8	2.7	2.6	2.4	2.2	2.4	2.4	2.5
Other cheese as such [ab]	kg	5.3	5.4	5.5	5.6	5.6	5.7	6.5	6.3	6.2	6.3	6.1
Total Cheese	**kg**	**11.2**	**11.3**	**11.2**	**11.5**	**11.6**	**11.3**	**12.1**	**11.7**	**11.9**	**11.8**	**11.6**
Yogurt	L	3.0	2.9	3.0	3.1	3.0	3.2	3.2	3.5	4.0	4.6	4.9
Sour cream	L	1.0	1.0	1.0	1.0	0.9	0.9	1.0	1.1	1.2	1.3	1.3
Ice cream	L	10.7	10.0	10.9	11.7	11.4	10.9	10.3	10.2	10.0	8.6	9.2
Margarine	L	5.6	5.2	4.9	4.3	5.1	5.3	5.4	5.4	5.2	5.0	4.9

a Not including cheddar and other cheese used in process cheese.
b Per capita consumption of whey and skim milk cheese is included in this category.
Source: Statistics Canada, Catalogue No. 32-229, and 32-230.

Research and Service Committee Reports – Service Priorities and Recommendations (2002)

Aquaculture

Aquaculture Subcommittee

Executive Summary

Ontario's aquaculture industry remains at an important crossroad in its developmental progress. The province possesses all of the infrastructure and expertise necessary to support a significantly larger fish-farming sector than currently exists. Slow progress in addressing the conflicts and impediments inherent in the confused regulatory framework surrounding aquaculture continues to stifle growth of the industry. The issue of First Nations' land claims remains unresolved and still stands in the way of new cage culture site approvals. During the coming year, a number of new regulatory initiatives at both the federal and provincial levels will begin to affect Ontario's aquaculture industry. While market demand for Ontario aquaculture products is strong and increasing, fish farmers remain frustrated by the lack of progress in resolving government impediments to the growth of their industry. Creating an environment conducive to further development of the industry will require an acknowledgement by all government agencies that a successful aquaculture sector is desirable and beneficial for Ontario.

Technology transfer is an added focus in this report. However, the present small size of Ontario's aquaculture sector means that communication between the industry and researchers is not as difficult as for other larger livestock sectors. Current university and government initiatives in this area are fulfilling technology transfer needs as they arise. Martin Mills Incorporated deserves special mention for initiating, organizing, and sponsoring an annual technology transfer workshop targeted at Ontario's cage culture producers.

Service priorities and the main issues facing the industry remain unchanged from the previous year. The committee endorses the continuance of all research recommendations detailed in our 2001 Annual Report. These previous research recommendations are included as Appendix 1.

Mandate

The Ontario Aquaculture Research and Services Coordinating Committee (OARSCC) was established in 1985. OARSCC provides a forum for the exchange of ideas between the industry and those government agencies that administer relevant legislation, or which provide services to fish farmers. The committee also serves as one of twelve species subcommittees of the Ontario Animal Research and Services Committee, which is part of the umbrella Ontario Agricultural Services Coordinating Committee. This structure is part of a well-established system of committees that coordinate agricultural research and service priorities at the federal and provincial levels.

OARSCC strives to identify and establish priority requirements for aquaculture research and service programs in Ontario on an annual basis, with the goal of encouraging the orderly expansion of the industry. The committee also endeavours to ensure liaison and

communication between those agencies and groups that have a primary interest in the long-term development of aquaculture in Ontario.

Industry Overview

For six years now, Ontario's aquaculture industry has operated under an 'unofficial' moratorium on significant growth resulting from a constraining regulatory environment. Total production has remained effectively stalled within a range of approximately 4000 metric tonnes, plus or minus 10%, since 1996. No new cage culture sites have been approved during the past year and likely will not be approved in the near future. As well, confusion arising from the co-management of public waters by the Ministry of Natural Resources and First Nations groups exercising land claims, is adding to the difficulty of establishing new sites. The pace of the joint industry-government working group on issues regarding cage culture operations remains glacial.

New legislation and regulations, at both the national and provincial levels, will begin to affect Ontario aquaculture producers over the next 12 months. Federally, there are changes coming in the area of "Introductions and Transfers". Additionally, a new "National Aquatic Animal Health Program" has been proposed. Provincially, the "Nutrient Management", "Food Safety and Quality", and "Livestock Medicines" acts will also come into effect. The extent to which these new regulatory initiatives impact fish farmers is uncertain and will only become fully apparent as they are implemented.

Canada's federal Department of Fisheries and Oceans has carried through with its initiatives to recognize and support aquaculture. A federally sponsored collaborative industry-government research and development program (Aquaculture Collaborative Research & Development Program – ACRDP) is successfully underway and a number of research projects directly addressing priorities identified by OARSCC have commenced.

Demand for Ontario aquaculture products is strong and growing, and industry participants are increasingly frustrated by the provincial government's repression of fish farming. Aquaculture is a form of primary production that has the potential to contribute much more to Ontario's economy than currently exists ($50–60 million in 2000, Aquastats 2000, University of Guelph). If the industry is not permitted to grow, the "multiplier" benefits from this primary production will not be realized and consumer dollars will increasingly be spent on imported fish products. The experience and expertise that has developed in Ontario's aquaculture sector over the past thirty years will not be retained if potential new entrants, as well as existing farmers, do not see reasonable access to these expanding opportunities. Ontario possesses the natural resources, experience, expertise, infrastructure and market opportunities to sustain a significantly larger aquaculture industry than currently exists. The missing component is a more enabling and stable legislative and regulatory environment in which to do business.

Service Priorities

1) Clinical Veterinary Services

The University of Guelph's extension veterinary services have been essential to the development of Ontario's aquaculture industry. Fish health management is less advanced, and arguably more demanding, than conventional livestock health care. As genetic and nutritional advances speed fish growth, access to immediate and reliable veterinary help will become increasingly important. The laboratory infrastructure and advanced expertise at the University will remain essential, even if full-time private sector veterinary services for fish health become available in Ontario. The maintenance and enhancement of the clinical veterinary services offered at the University of Guelph are critical to the ongoing development of our aquaculture sector.

2) Image Enhancement

Image enhancement presents a particularly significant opportunity for Ontario aquaculture, since the public is becoming increasingly aware of the health benefits of omega-3 fatty acids and the potential contaminant problems in seafoods obtained through the traditional capture fisheries.

Advertising agencies are used by major commodity groups to build favourable images for their products in the public eye. This type of promotion may be the only way producers can counter the negative campaigns many environmental organizations are conducting against commercial agriculture and livestock production. Smaller commodity groups like aquaculture, do not have the financial resources to develop effective generic promotional advertising. To support the development of newer agricultural industries, assistance in public image enhancement should be recognized as a priority for the public sector agencies.

3) Licensing

The present system of licensing aquaculture operations in Ontario constitutes a challenging barrier and constraint to the development of the industry as a whole, as well as to individual producers. Aquaculture licenses are issued by the Ministry of Natural Resources and may be conditional upon a variety of factors. Examples are production quotas, water testing requirements, and species limitations. While the rationale behind such conditions is sound, the application practices are inconsistent and frequently unjustified from a cost/benefit point of view. For instance, water-testing requirements may be imposed that cost many thousands of dollars annually but yield little or no useful data for safeguarding the environment. For cage operations, the process involved in obtaining a new licence has become unreasonable; the application procedure can take years to complete and demands a large financial commitment with no assurance that the rules governing approval won't change arbitrarily.

New licences for inland aquaculture facilities normally require the proponent to obtain a "Certificate of Approval" and a "Permit to Take Water" from the Ministry of the Environment. During 1998, a new fee schedule was introduced for the Certificate of Approval application process. Previously, fees were charged according to the capital cost of the subject works, and ranged between a minimum of $50 to a maximum of $100,000. That system allowed for the obvious difference involved in reviewing an application from a farm or small business pertaining to a proposed water treatment facility that might consist simply of an earthen settling pond with construction costs of just hundreds or perhaps a few thousand dollars, as opposed to reviewing an application from a major manufacturing facility that might involve sophisticated treatment processes to lower toxic contaminant levels in effluents and cost millions of dollars. The new fee schedule does not distinguish between these situations. The application fee is a minimum $6,200 to a maximum of $33,200 and depending on circumstances, the maximum could conceivably be applied to the earthen settling pond while the multimillion-dollar industrial process wastewater treatment plant could pay the minimum. This can be prohibitive to the farm or small business, while inconsequential to the major manufacturer.

4) Extension Services

The Ontario Ministry of Agriculture and Food has acquired additional aquaculture expertise in the food safety area, significantly strengthening the industry's ability to cope with problems and obstacles arising from our regulatory framework. In addition, the University of Guelph's Aquaculture Centre has done an exemplary job of facilitating the transfer of knowledge from research results and technical information to the industry. In the near future, new legislation and regulations under the "Livestock Medicines Act", the "Food Safety and Quality Act, 2001", and the "Nutrient Management Act" will fully tax all extension resources available to the aquaculture industry. To realize the effective implementation of these new rules and policies, existing extension resources must be retained and enhanced in order to cope with the rising demand for information transfer.

5) Provincial Research Infrastructure

The existence of the Alma Aquaculture Research Station has facilitated the development of a provincial research infrastructure that is responsive to the needs of Ontario's aquaculture industry. Alma is open to both proprietary and non-proprietary projects funded by the private sector, constituting a genuine service delivery to the industry. The atmosphere fostered through such close collaboration with producers carries-over to aid the focus of related research at the main campus of the University of Guelph. Consequently, our provincial research infrastructure and Alma's role therein, provides a real and important competitive advantage for Ontario aquaculture. This service function needs to be maintained in order for Ontario to stay competitive in the rapidly changing, technology-driven industry that is modern day aquaculture.

6) Subsidy Programs

Fish farmers face many of the same financial problems and hazards that conventional livestock producers do, but frequently are not eligible for "safety net" or other support programs, either through simple oversight or through a lack of flexibility in program structure that could often easily accommodate "non-conventional" producers. Additionally, conventional 'terrestrial' livestock operations are frequently subsidized for expenses incurred for environmentally driven requirements, while such expenses normally comprise an ongoing cost for aquaculturists. These expenses can be expected to increase substantially as compliance measures for the "Nutrient Management Act" are introduced. However, OMAF intends to make any new programs to alleviate the cost of compliance available to fish farms, and this may mitigate the growing burden associated with environmental compliance requirements.

7) Financial Services

Access to debt financing and operating capital is available to Ontario aquaculture producers through the same channels and providers that conventional livestock operations use. Loan guarantee programs, when available, facilitate access to financing, especially for beginning farmers. While the situation within the province is reasonably equitable, Ontario producers have historically been, and continue to be, significantly disadvantaged relative to east coast maritime producers who benefit from comparatively generous financing assistance programs designed to stimulate regional economic development. In particular, public and private sector groups interested in promoting aquaculture development in Northern Ontario must be prepared to address the competitive threats arising from these circumstances.

8) Dead-Stock And Offal Disposal

Removal services are as necessary for the aquaculture industry as they are for other animal industries. The province may be required to support this service if private sector operators withdraw or curtail their businesses for economic reasons.

Main Issues Affecting Aquaculture Sustainability In Ontario

1) Profitability

Production of food grade fish on a commercial scale must demonstrate improved and sustainable profitability if aquaculture hopes to become a significant industry in Ontario. Although a number of fish farms enjoy financial success by addressing specific market niches, such as live fish sales for various purposes, the history of larger-scale production has not been encouraging. The fundamental reason behind this problem is the fact that wholesale prices for rainbow trout at the farm level have not moved much for two decades, while input costs have risen substantially. Other farm sectors have also faced the same problem, but have had greater success in bringing down costs of production. Aquaculture is also gaining significant additional costs through added regulatory burdens.

Much of the ongoing research and service activity at the University of Guelph relates to the issue of profitability, particularly in the areas of health management, nutrition and bio-energetics, and genetics, breeding, and reproductive control. This work must continue, with an intensified focus on projects having the most potential to directly lower the unit cost of production.

Increasingly, profitability is being negatively affected by the interplay between environmental issues and the constraining regulatory framework surrounding aquaculture in this province.

2) Regulatory Framework

Aquaculture does not readily fit into Ontario's existing legislative or regulatory framework. At present, neither the Ontario Environment nor Natural Resources Ministries have been prepared to acknowledge that the growing of fish for human consumption is essentially an agricultural activity. Until that recognition is achieved, it is doubtful that any coherent provincial policy governing fish farming can emerge. In the meantime, aquaculture development is burdened or thwarted by uncertainty and uneven application of regulations, as well as the application of regulations written for other activities. The cost in time, effort, and direct financial outlay to the industry from this situation has had a considerable negative impact on profitability.

The Ontario Ministry of Agriculture and Food needs to continue its strong advocacy of aquaculture and promote acceptance of fish farming as an agricultural activity.

Examples of two key regulatory points that give rise to numerous related problems are the categorization of fish manure as an industrial, rather than agricultural, waste product and the failure to accept domestically raised fish as private rather than public property.

3) Environmental Issues

Public scrutiny of all aspects of water use is increasing, concurrent with continued vocal criticism of aquaculture by environmental organizations across the country. Regulatory agencies require data on the industry's environmental footprint within Ontario to counter the impact claims of aquaculture opponents. Although controversial regulatory issues are often decided politically rather than rationally, sound scientific evidence favourable to an industry's position is essential in today's public environmental arena. As an industry, aquaculture in Ontario has neither the size nor the profitability to contend with its opposition on its own.

Work aimed at developing site assimilative capacity models is presently underway at the University of Guelph and by a multi-agency/stakeholder committee led by the Ministry of the Environment.

For the cage sector, much of the concern surrounding perceived and actual environmental impact could be alleviated if investigation of decommissioned or fallowed sites indicated that these areas returned to a "natural state" relatively quickly. Regulation based on a mass nutrient loading approach combined with information on regenerative periods would also allow the cage sector of the industry to work towards an operational model involving site rotation, analogous to the practice of field rotation in land-based agriculture. For inland sites, regulation based on annual nutrient loading from a facility and the assimilative capacity of the watershed would permit evaluation of the impact of a particular fish farm relative to other nutrient sources. Mitigation, if required, could then target the source providing maximum benefit for minimum cost.

2) Competitiveness

Ontario fish farmers must compete with food products coming from traditional capture fisheries, from other aquaculture industries, especially those of Canada's east coast, and perhaps most importantly, from other red or white meat industries such as beef and poultry. Key to this issue is the need to continually strive to lower production costs and to market products that readily gain consumer acceptance.

In addition to previously noted research at the University of Guelph intended to lower production costs, work has also started on extending the shelf life of fresh fish fillets.

Fresh rainbow trout, primarily in filleted form, constitutes Ontario's main aquaculture product. To effectively compete with other red and white meats, diversification and refinement of product forms is desirable. With regard to lowering production costs, the most potential gain would come from development of less expensive feeds.

3) Public Perception

In spite of the vocal criticism of aquaculture by environmental activists, there remains a strong perception that aquaculture is an industry of the future. While this perception is largely based on the sad realization that the law of the commons will inevitably lead to

the end of the global capture fisheries, it is nonetheless a strong positive force for the industry and should be emphasized with respect to the future potential of fish farming in Ontario. Additional opportunities to win support for the industry stem from increasing public awareness of the health benefits of fish consumption, which are significant. Since Ontario fish farmers lack the resources to directly counter the negative media campaigns of large non-governmental organizations opposed to aquaculture, efforts should be made to gain public support through communicating beneficial aspects of the industry which are generally accepted and difficult to dispute.

The University of Guelph/OMAF Aquaculture Centre currently handles much of the public and media advocacy for the industry. The Ontario Aquaculture Association lacks the size and resources to be effective in that area. Public perception will play a significant role in determining the future of Ontario fish farming. The Aquaculture Centre has the capability to take a more active role in public media advocacy for the industry and should extend its activities in that direction.

Technology Transfer Requirements

Through a variety of publications and workshops, the University of Guelph/OMAF Aquacentre has been the primary facilitator of technology transfer from the research sector to the aquaculture industry. The Aquacentre is making effective use of the internet to augment its traditional routes for information dissemination, and that will gain in significance as broadband becomes available beyond our major urban areas. The Ontario Ministry of Agriculture and Food is also expanding its aquaculture expertise, particularly in the food safety discipline, and may become an important contributor to technology transfer in future. But in the near term, OMAF personnel will be fully engaged with the implementation of new legislation applicable to fish farmers.

The present small size of Ontario's aquaculture sector facilitates successful technology transfer, and therefore OARSCC considers existing initiatives in this area sufficient, provided that cutbacks do not impinge on the current infrastructure. This is an area of critical concern since aquaculture program changes at the University of Guelph, pursuant to significant restructuring of the UG-OMAF Partnership Agreement, have yet to be announced.

Martin Mills Incorporated, an Ontario based supplier of aquaculture feeds, deserves special mention and commendation for instituting, organizing, and sponsoring an annual technology transfer workshop specifically aimed at the province's cage culture operators and their suppliers. By bringing together the people directly involved with the overwhelming majority of Ontario's commercial rainbow trout production, Martin Mills has established an excellent venue for delivering practical and relevant information to the industry's key production segment.

Conclusion

Significant future expansion of the aquaculture industry in Ontario can still occur, although the window of opportunity for the aquafarming sector will not stay open indefinitely. Ontario possesses ALL of the infrastructure requirements to enable this expansion and follow the global trends in aquaculture growth which have averaged 11% per annum increases on average over the last decade. Unlike many other meat commodity industries which predict, at best, only steady-state demands for their production, there are a plethora of credible reasons why aquaculture can, and will, expand dramatically over the next few decades. Both land-based and near-shore cage culture operations in Ontario are viable, however, Ontario's regulatory and economic climate will continue to be the largest factors influencing the growth of aquaculture here.

Notwithstanding these constraints, it is of the opinion of many experts that aquaculture has a dramatic potential for growth over the next 2 decades. The province must seize the opportunity to expand, diversify and stabilize its agricultural sector through the production of aquatic food products.

Beef

Beef Subcommittee

Executive Summary

Procedure

The format for this year's formulation of priorities for the beef sector was a departure from the past. During the year, several meetings of industry and government groups were held where extension/technology transfer needs and priorities were discussed. In addition, the formal program planning processes of the OMAF Beef Team and the Ontario Cattlemen's Association identified technology transfer priorities. The OMAF Contract Research Proposal and Review process at the University of Guelph provided an overview of research projects and associated technology transfer activities. The output of these meetings and highlights of the planning documents were compiled into a draft technology transfer priority list by the Beef Subcommittee co-chairs and circulated to committee members. Feedback from committee members (most of whom had attended at least one of the previously mentioned meetings) was assimilated into this report.

This procedure allowed the output of a range of venues and processes to impact on the final priority setting process at the OARSC subcommittee level. However, a possible negative aspect of this process was that agri-business may have been less represented in the output than in previous years.

Ontario Beef Industry Issues

A number of challenges are currently presented to the Ontario Industry. Some are of national scope while others are specific to the province.

United States Country of Origin Labeling

This is a regulatory initiative invoked by the U.S. government. It will require that beef packages be labeled to reflect the country in which the meat originated. This is a significant threat to Canada since we export over 50% of our production, with the US being the primary export market. It will impose major additional costs on meat processors who will have to sort product and maintain separate production lines or runs to ensure the integrity of their identification process. This will reduce profit in that sector which will be passed on as lowered product prices to producers. It will also create a barrier to Canadian exports to the US as their processors may choose to exclusively source US product to minimize the extra effort required to meet the regulations.

Agriculture Policy Framework

This governmental policy will set the environment for Canadian producers for the next five years. The five pillars are key, particularly business risk management, food safety and environment. Equivalency of Ontario with competing jurisdictions (e.g. Quebec) is essential for the Ontario industry to compete.

An effective disaster program is critical (continued losses in the feedlot sector as example of need).

Nutrient Management Act

Bill 81 will regulate the storage and applications of nutrients, having a major impact on farming activities and industry expansion. The regulations which are currently being formulated will are key to the impact which the Nutrient Management Act will have. The industry has been very proactive in the formulation of the draft regulations. The regulations must allow Ontario producers to be competitive, through a balance of meeting environmental goals while acknowledging the impact of regulations on the industry. Regulations formulated for the public good, which require significant expenditures by producers should be supported with publicly funded financial assistance.

Technology Transfer Landscape

Over the past several years, he role of the various players in agricultural technology transfer in Ontario has undergone significant change. A key in this process has been the reduced OMAF(RA) budget available for traditional extension / tech transfer programs. This has been manifested by a significant reduction in field staff and field locations, and an increased reliance on electronic information technology. Concurrently, reductions in funding to the University of Guelph have precipitated a reduced University effort in technology transfer.

Industry participants, notably the Ontario Cattlemen's Association and Beef Improvement Ontario have been actively involved in forming partnerships with OMAF to ensure that the effectiveness of delivery of technology transfer is maximized. This is being accomplished through ongoing discussions and agreements which minimize duplication of activities and allow the groups to work closely together by focusing on common key objectives. In general, these initiatives have been successful. However, it should be noted that this approach is best suited to issues – based initiatives, and does not address the need for a general technological knowledge base available to the industry.

OMAF

The provincial government remains a critical component of technology transfer in Ontario. Despite cutbacks, OMAF retains its role as the lead entity providing technical information. OMAF is the only entity which maintains a large database of information on most aspects of beef production and marketing. This database is accessible directly through the Internet or via a telephone call centre. It constitutes a virtual encyclopedia of beef related information. A goal of OMAF is to be the window on the technological resources of the world for Ontario producers

OMAF is still involved in live meeting tech transfer, but these initiatives are largely priority driven, in response to major industry issues such as environmental stewardship or disease threats. Courses or seminars covering general production technology are

declining as scarce extension resources and the emphasis on issues based tech transfer become reconciled.

Another role for government tech transfer is to provide independent evaluations of technologies, including cost/benefits and alternatives. This role is highly valued by producers who are increasingly exposed to capital intensive and proprietary technologies.

University of Guelph

The role of the UG in technology transfer has diminished over time. The University has focused its limited outreach resources on specific technologies which are the products of its own research programs. The annual Beef Research Update published by the UG is an excellent source of research results, but the format (mini – scientific papers) is intimidating to the average producer. The main utilizers of this information is OMAF tech transfer staff and other industry professionals. These individuals interpret the results for general use by the industry.

The plain language SPARKS publications are excellent updates on research, but the number of beef articles published per year is limited due to the wide scope of the SPARKS Program.

Industry Organizations

Industry organizations such as the Ontario Cattlemen's Association, the Ontario Cattle Feeder's Association and Beef Improvement Ontario pursue focused technology transfer agendas. These entities respond to the priorities of the day which are impacting on their members, and their tech transfer initiatives tend to reflect these. They do not have a mandate to be providers of a broad resource of technical information. Beef Improvement Ontario has necessarily focused on technology which is part of the services which they market, and have a vested interest in providing technical information which is supportive of those areas of science.

Agri-businesses

Agri-businesses are profit motivated and must generate revenue through the sales of products and services. As such they are highly focused entities which depend on the purchasing of branded technologies by producers. They have very little interest in the transfer of general technical information and no interest in transferring any knowledge which does not support the purchase of their products.

Agribusiness can serve as valuable partners in technology transfer initiatives through extensive networks of dealers and financial support of tech transfer events.

Technology Transfer Priorities

The initiatives generated at the various priority setting and collaborative meetings may be categorized under one of three general topics: [the topics are not placed in any priority order]

- **Environment**
- **Quality Assurance**
- **Production and Marketing.**

Environment

The recognition of environmental impacts as an important component of beef production has moved through several stages. The industry has gone through a period of increasing awareness, a stage of demonstration projects and non-regulatory recommendations, and is now entering the era of comprehensive regulation.

Greenhouse Gas Emissions

- The role of agriculture in general, and the beef industry in particular in the production of so-called "greenhouse gases" has been highly publicized. Despite the weaknesses in this theory of climate change, and the relatively small contribution of the beef industry to overall GHG emissions, the industry will be expected to play a part in their reduction. (Assuming ratification of the Kyoto Accord.)

- Strategies for reducing GHG need to be made known to the industry and some system of tracking their implementation will be required.

Nutrient Management Act

- The impact of these regulations will be far reaching. Producers will need to know the content of the regulations which impact on them, and how be compliant without disrupting their operation and minimizing cost.
- There is a great need for the dissemination of management techniques and facility modifications which will allow rational compliance with the regulations.

Best Management Practices

- These existing documents will likely play an important role in dealing with the results of NMA regulations. They need to be more widely publicized and adopted by producers.

- Additional BMPs need to be compiled to address the new areas under scrutiny in the Nutrient Management Act.

Quality Assurance

- This is a broad topic which encompasses source verification, implementation of recommended management techniques including pre-weaning and vaccination, and the handling of animals during transport.

- A number of industry initiatives have been implemented to address quality assurance, including the Canadian Cattle Identification Agency national herd of origin tagging program, the Canadian Cattlemen's Association Quality Starts Here project and BIO's Source Qualified Ontario Calves initiative.

- The newly revised Medicated Feeds Regulations will impact on the on-farm mixing of medicated feeds. The relevant content of these regulations needs to be communicated to producers so they can take steps to remain compliant while meeting their production needs.

Production and Marketing

- Cost of production information is lacking in the beef industry. The participation rate of beef farmers in the Ontario Financial Management and Analysis Project is low. Other mechanisms for gathering COP data are needed. OMAF staff have initiated projects aimed at capturing financial and production data in both the feedlot and cow-calf sectors. These projects need to be nurtured and promoted within the industry.

- The Breeder Loan Program has the potential to stimulate cow herd expansion by providing improved financing for breeding stock purchase and by providing a focus group for new entrants. This program should be promoted by all those involved in the industry.

- Marketing of beef is a diverse field. While a few major packers process and market the vast majority of beef cattle, there remain opportunities for niche marketing based on consumer preferences and product differentiation. The situation parallels that of the beer brewing industry, where market domination by a relatively few major breweries has been partially supplanted by the development of a large number of micro breweries who have achieved successful positions as niche marketers.

- Disease issues continue to surface in the production sector. Recently, Mycoplasma has been implicated in major losses in feedlots. Strategies to prevent the occurrence of Mycoplasma wrecks needs to be a priority.

Dairy

Dairy Subcommittee

Executive Summary

The Ontario Dairy Research and Services Committee (ORDSC) met on September 4, 2002 to identify "technology transfer" recommendations for the Ontario dairy industry and update the "research" recommendations submitted to the Ontario Animal Research and Services Committee (OARSC) in 2000 and supplemented in 2001.

In 2000, OARSC implemented a four year cycle, concentrating on different issues in each year. This year the issue was "Technology Transfer". The members of the ODRSC met with the OARSC on the morning of September 4, 2002 to hear an overview of technology transfer currently available to the Ontario Livestock and Poultry industries. The afternoon was spent identifying technology transfer priorities and reviewing research priorities identified in 2000 and supplemented in 2001

Eight technology transfer recommendations identified were: Reproduction; Facilities Design / Cow Comfort; Environmental Safety; Infectious Disease Prevention; Rate of Return; Nutrition; Breeding and Genetics; Support Industries for exiting producers

The committee reviewed research recommendations from the 2000 and 2001 reports. Additional emphasis on Reproduction research is recommended.

The Ontario Dairy Research and Services Committee (ODRSC) is scheduled to replace 8 members from research and industry.

Industry Update

Overview

- Trade-related issues have continued in the forefront over the past year. In December 2001, Canadian dairy farmers, processors and exporters welcomed the significant decision of the Appellate Body to overturn the earlier panel ruling that said Canada's commercial export milk approach was an export subsidy. The Appellate Body found the U.S. and New Zealand failed to prove that Canada's approach to commercial export milk is WTO inconsistent. Unfortunately, at the same time as this Appellate Body report was accepted, a request for a second Compliance Panel by the U.S. and NZ was also granted on the grounds that the Appellate Body findings were not definitive. This second Compliance Panel ruled in late June 2002 that Canada's approach to exporting milk is not WTO compliant. It said that Canada was providing export subsidies in excess of Canada's WTO obligations. Canada has appealed the latest Compliance Panel Report and that process is underway again during the fall of the 2002.

- In the environmental area, DFO has worked with its partner organizations in the

Ontario Farm Environmental Coalition in dealing with issues from the Walkerton Inquiry report. The approval of the Nutrient Management Act (Bill 81) in the Legislature in June and the subsequent public input in regulations has also necessitated constant attention to its progress through the legislative process.

- A number of animal health issues have DFO continuing to work with other livestock organizations and governments to help minimize their impact on producers and consumers. Although the concern over Foot and Mouth Disease (FMD) has lessened, others have gained public attention. Bovine Spongiform Encephalitis, has been linked to a death of the first Canadian from CJC, the human variant form. DFO, CFIA and OMAF have worked to deal with an outbreak of bovine TB in an Ontario dairy herd over the past few months.

- For the second year in a row, weather conditions throughout most of Ontario in the summer and early fall of 2002 have been extremely hot and dry. This has meant that the quality of many of the crops harvested by dairy farmers is quite variable across the province. Fall and winter milk production levels may again suffer as a result of the expected poor feed quality.

- Total milk production in Ontario was up 2.8% for the dairy year ending July 31, 2002. Actual production was 2.56 billion litres, compared to 2.49 billion litres in 2001.

Herd and Farm Profile

- In July 2002, 5,938 milk producers sold milk to DFO compared to 6,216 a year earlier. There were also 102 cream producers in July 2002 compared to 119 a year earlier.

- Ontario DHI statistics show average performance of published records is now 8,983 kgs of milk, 337 kgs of butterfat and 290 kgs of protein. Now, 71% of the dairy herds in the province are on some form of milk recording.

- As was the case last year, new dairy barn construction continues in Ontario, with new facilities being predominantly free-stall barns with bunk silos and, in some cases, commodity sheds. Three manufacturers are now installing Automated Milking Systems (AMS) or the "robotic milker". Twenty-eight farms in Ontario use this method to milk cows in Ontario, using 42 robots.

Milk Marketing Conditions

- Ontario is continuing to use an Export Contract Exchange, operated by a third party administrator, as its method of providing export opportunities that are not included in Canada's WTO commitments for subsidized exports.

- Producer quotas were reduced by 1 % on June 1st to bring quotas in line with the provincial market share quota allotted to Ontario. In September 2002, producers were given an extra day of production credits for each of October and November. This was in addition to the 1.5 days of fall incentive credits for each of September, October and November that had been earlier announced. At the beginning of October, it became apparent that milk supplies were lower than required so an additional 2 days of quota credits were added for the month of October. This meant that there were 4.5 days of fall incentive quota credits available for October.

- Average provincial component tests changed marginally for the dairy year ending July 31, 2002. Butterfat average for the year was at 3.90 kg/hl compared to 3.92 kg/hl a year earlier, while protein was at 3.34 kg/hl compared to 3.33 kg/hl the previous year.

- Component prices for within-quota shipments during August 2002 were as follows: (August 2001 figures in brackets) Butterfat $5.91\kg ($5.95); Protein $9.41\kg ($9.26); Other solids $1.36/kg ($1.31). The average gross return for milk marketed within quota during August 2002, was $60.39 per hectolitre, compared to $59.70 per hectolitre in August of 2001.

- Quota prices in Ontario have varied in the 13 months with a low in October 2001 of $18,100/kg to a high in October 2002 of $23,498/kg.

Canadian Dairy Products Reasonably Priced

- Price comparisons between the U.S. and Canada continue to show that, overall, Canadian consumers are paying lower prices for a "basket" of dairy products. The most recent semi-annual survey conducted by Dairy Farmers of Canada, based on Agriculture Canada survey methods in the summer of 2002, showed that on average, Canadians pay about 28 per cent less for their dairy products than Americans do. At less than 2% of take-home pay, Canadians have the most reasonable priced dairy products in the world.

Government Relations Strengthened

- The past year has seen a high priority placed on government relations. In addition to ongoing efforts to develop a strong, united and coordinated support for the marketing system at the provincial and federal levels, it has been necessary to pay considerable attention to issues management, because of several Legislative Bills affecting the dairy sector.

- The Food Safety and Quality Act was passed in the Legislature on December 5, 2001. DFO was concerned about the repeal the Edible Oil Products Act which was included in this legislation. DFO has argued that the act provides the legislative framework to protect the identity and integrity of dairy products from imitations and substitutes. While it was suggested that there are federal regulations in place to address the

concerns, DFO believes that not to be the case. Provincially, DFO is working with OMAF staff and the Ontario Dairy Council to identify the gaps that we feel need to be addressed. We have also been pursuing the matter at the federal level with DFC and the Canadian Food Inspection Agency (CFIA) in an attempt to strengthen the CFIA's Guide to Food Labeling and Advertising.

- Another piece of provincial legislation, the Nutrient Management Act, which was passed in June 2002, is also being monitored. DFO has worked in partnership with the Ontario Farm Environmental Coalition to develop fair and practical principles that reflect the diverse needs of all Ontario farmers. Currently, OFEC is working with the preliminary regulations in Stage one of the Nutrient Management Plans (NMP) and has concerns about the use for categorizing farms and the lack of standards for biosolids and commercial fertilizers.

- At the Federal level, DFO has been working with industry partners on Bill C-15B (Cruelty to Animals) and Bill C-5 (Species at Risk). Livestock producers are concerned that C-15B would open the door for frivolous prosecutions by those against animal agriculture by designating farm animals as more than property. Dairy producers have voicing their concerns over the past several months on the Bill. The Species at Risk Bill also concerns food producers because of a lack of provisions for compensation to farmers who may be affected by actions required as a result of this legislation.

- DFO, through their national organization, DFC has asked the federal government to strengthen import controls to cover dairy blends and dairy ingredients because of concerns about increasing levels of importation. As a supporter of our system of supply management, the government needs to give the tools to operate the system effectively.

- DFO has also participated in several consultation stages during the development and refinement of the federal governments Agriculture Policy Framework (APF). DFO's vision is in concert with the APF five pillars of food safety and food quality, environment, science and innovation, renewal, and business risk management.

Dairy Farmers of Ontario's Research Support

- Dairy Farmers of Ontario continues to support agriculture and agri-food related research based upon a research check-off on all domestic milk marketed. Over the past year DFO supported more than $1 million in various research projects and activities. Most of this funding supports work at the University of Guelph with some funding also going to Agriculture and Agri-Food Canada Research Stations.

Canadian Quality Milk (CQM) Program

- The CQM is a HACCP-based program that focuses on prevention and early intervention.
-
- A technical review of the program is currently in progress by the Canadian Food Inspection Agency. This is expected to be completed by late fall, 2002. Minor changes will likely be made to the program as a result of the review.

- The CQM program will enhance the existing raw milk quality program in Ontario. The four key elements of the program that will be implemented province wide are:

1. Time and temperature monitoring of CIP systems and milk cooling and storage.
2. Livestock medicines management certification including storage, record keeping of treatments, animal identification, and treatment and milking procedures.
3. Farm specific operating procedures for milking, livestock medicines, animal identification, farm-labour training, pesticides management relating to homegrown feeds, and medicated feed management.
4. Water testing to verify potable water is used to clean milking equipment.

- The rollout of the program to all Ontario farms will begin in early 2003 and will likely take place over a three-year period.

- A Healthy Futures grant has been obtained to offset a portion of DFO costs. DFO has not yet made a decision on how to allocate these funds to producers.

Technology Transfer Recommendations

Current "technology transfer" is provided by OMAF, University of Guelph, Ontario DHI, Dairy Farmers of Ontario, veterinary practitioners, private industry and consultants to the Ontario dairy industry.

As indicated in the "State of the Industry" report, the Ontario dairy industry continues to adopt new technology to keep it competitive and progressive for the foreseeable future. A component of this success is due to the supply management and orderly marketing system that has provided stability in the past and confidence to plan for the future.

The ODRSC committee identified eight priorities for technology transfer. The committee identified the first five priorities listed below as higher priorities. The other three were ranked as medium priority.

1. Reproduction

Reports in recent years from the United States and from producers and veterinarians in Ontario have indicated that there has been a large decline in conception in dairy herds. DHI data confirms the decline. While significant information is available,

research needs to continue in reproductive physiology and farm management as it relates to production efficiency and animal health.

The committee recommends that OMAF designate a person as the lead to assemble available information and develop a technology transfer program in cooperation with the Ontario Association of Bovine Practitioners (OABP), Ontario DHI, University of Guelph, Ontario Veterinary College and the AI units to disseminate relevant material to producers.

OMAF, Ontario DHI, Ontario Association of Bovine Practitioners (OABP), AI Units, University of Guelph, Ontario Veterinary College

2. **Facilities Design / Cow Comfort**
A significant amount of new information is now available on the design of dairy barns and cattle facilities for efficient operation and animal comfort. There is a continued demand by producers to acquire the best current design specifications for new and renovated facilities.

The committee recommends the continuation of the current OMAF dairy housing workshops and applied research into the interaction of cows and their environment. As research data continues to be collected, the workshops need to be continually updated.

OMAF, AAFC, OABP, Canadian Farm Builders Association, private industry

3. **Environmental Safety**
The public has a raised awareness of environmental concerns and the potential of agricultural practices. Producers need to have available information to address public concerns and pending legislative requirements in a science-based applicable format. This reflects the 2001 ODRSC research recommendations regarding environmental priorities.

OMAF, Dairy Farmers of Ontario (DFO), Canadian Food Inspection Agency (CFIA), DHI

4. **Infectious Disease Prevention**
Infectious and contagious diseases continue to have a significant negative impact on operations. Current management and housing practices may be increasing the risk of infectious disease. Zoonotic diseases, including those that that have no impact on animal health but could impact negatively on human health and product reputation may significantly impact markets.

The committee encourages the continuation of the current efforts to make producers and industry aware of the risks of infectious diseases and their treatment and prevention, including relevant bio-security risks for dairy farms associated with movement of animals, equipment and humans between farms.

OMAF, U of G, CFIA, OABP

5. **Rate of Return**
Producers must make adequate profits from the industry. Although this particular item has been ranked in the middle, it is implicit within all of the items identified.

Ontario DHI has developed "Return over Feed" management clubs.
"Return over Feed" allows a producer to evaluate milk sales in comparison to feed costs. It teaches them, by example, to measure the impact of changes in a real-world manner.

The committee encourages the establishment of Farm Management Clubs. These will assist producers to understand and evaluate the financial position and results of their farm. This is a similar recommendation to the ODYSSEY Report that recommends the establishment of Farm Management Clubs through the facilitation of the General Farm Organizations (GFO's).

OMAF, DHI, DFO, U of G, General Farm Organizations (GFO's)

6. **Nutrition**
Feed cost represent the highest cash expense on the majority of dairy farms. Dairy nutrition research continues at a high level.

Current, relevant information needs to be assembled and transferred to Ontario producers and support sectors on a continuing basis.

OMAF, U of G, OABP, feed industry

7. **Breeding & Genetics**
Producers need information on potential gains that can be made with overlooked breeding opportunities. On the other hand, concerns have been raised with the current level of inbreeding in Canadian dairy breeds. Holstein and Jersey breeds in Canada have an average inbreeding level that is approaching 5%.

OMAF, AI companies, University of Guelph, OVC

8. **Complementary Enterprises for Those Leaving the Industry**
Producers leaving milk production still have knowledge, skills and equipment that could benefit the industry. Those wishing to direct their energy within related enterprises need assistance to identify and develop profitable opportunities.

OMAF, University of Guelph

Deer and Elk

Deer and Elk Subcommittee

Executive Summary

Working Definition: The dissemination of information to facilitate the efficient and timely adoption of beneficial technologies and management practice on Ontario livestock and poultry farms.

The committee chairman expresses his sincere thanks to all of the committee members for their time and active participation in this years meeting.

Discussion topics and highlights will be presented in point form:

The committee highlighted the following existing initiatives as very positive examples of technology transfer that they wanted to endorse and encourage:

1. The committee highlighted the CWD veterinary training course that has been so ably lead under the stewardship Dr. Bob Wright of OMAF, as an excellent example of effective technology transfer. This OMAF initiative has educated Ontario veterinarians in regard to Chronic Wasting Disease in farmed and wild Cervid populations, as well as, in techniques required for obtaining OBEX samples from deceased animals. The committee wishes to express its very strong support and appreciation for this program.

2. A detailed information package concerning CWD and associated programs is to be sent out through CFIA cooperation by OMAF to all known Ontario cervid owners. The committee suggested that the information material include contact numbers for all provincial deer and elk associated groups. Brian Tapscott of OMAF is coordinating this mailing. The committee fully supports this information/technology initiative.

3. The OMAF website was highlighted by the committee as a useful and informative resource for technology transfer to Ontario cervid producers. The committee recommended that the use of the OMAF website be expanded in terms of cervid content. The committee thanked Brian Tapscott for leading the development and management of cervid associated information on the website. The committee further identified the need for a centralized resource such as the OMAF website to be used as a central gathering point for the assessment and presentation of worldwide cervid related research data and production information for use by Ontario producers and breeders. **The committee suggests that Brian Tapscott from OMAF should lead this activity and to this end suggests that a greater proportion of Brian's present position assignment within OMAF be allocated to deer and elk work.**

4. A further example of appropriate technology transfer is the recent development and expansion of the Ontario Elk Breeders Association (OEBA) web site to include important practical information for Ontario producers related to provincially related resources and commercial service providers, as well as, elk meat preparation and cooking information

directed at Ontario consumers. OEBA has also prepared an elk product preparation and cooking guide for Ontario consumers in a brochure form.

5. The velveting accreditation short course was also sighted as a valuable past, present and future resource for technology transfer to provincial cervid producers. The velveting short course serves as a venue by which Ontario producers obtain training in the humane and efficient harvesting of velvet stage antler.

6. The committee suggested that all provincial meat inspectors be educated and trained in obtaining OBEX samples for CWD testing of slaughtered animals.

7. The need was identified for more information to be made available in the area of meat processing, carcass dissection, safe meat handling and product market development. Discussion centered on the potential development of a cervid meat science/processing short course for Ontario producers wishing to develop safe commercial meat markets. The committee suggests that the food science/meat science groups at the University of Guelph be encouraged to develop such a short course for Ontario cervid producers.

8. Pending provincial legislation/regulatory changes targeted for April 2003 will require Ontario livestock producers to become certified in order to be able to purchase over-the-counter livestock medicines from licensed outlets. Cervid producers wishing to become certified will be required to attend a one-day Livestock Medicines course. The Ontario Deer and Elk Farmers association is exploring funding for the development of deer/elk specific livestock medicines course for Ontario producers.

Other arising issues:

9. The lack dead stock removal and offal disposal and rendering systems remain a significant unresolved issue for all Ontario cervid producers.

10. The committee suggests that slaughtered animals (or at least some percentage of slaughtered animals) be made eligible for funding under the CWD-test funding program, which is administered by the Canadian Cervid Council (CCC). Partial funding for CWD surveillance in farmed deer and elk is being provided through OMAF's Healthy Futures for Ontario Agriculture Program. This change would require CCC support. The suggestion was made in order to better utilize the available funds and to increase the number of tested animals.

11. The committee also suggests that the Ontario Ministry of Natural Resources fund a CWD-testing/surveillance program for free-roaming deer harvested by Ontario hunters. This data would be of significant use in determining the provinces current CWD status amongst its wild cervid populations.

Equine

Equine Subcommittee

Executive Summary

The Annual Committee Meeting was held at Guelph on the afternoon of September 4, 2002 following the morning Technology Transfer Workshop. Although attendance appeared high, the majority of Committee participants were those working in research, academia and government. Many Committee members working in the field were unable to attend, since September tends to be a busy time for the industry when many of our industry representatives are involved in racing and breeding and are occupied with yearling and mixed sales. In the future, so that more participation may be achieved, it was recommended that the meeting be later in September, early October or early summer.

This report attempts to present an accurate analysis of the equine industry and it's technology transfer based on the discussion and information of the participants and communications I have had since, with those not attending. The priorities set out at the beginning of our four-year mandate were examined and reviewed. Despite fears of the economy slowing down last year, the sectors report the strength of the industry has been maintained throughout 2002.

The underlying issues within the industry are still those of services and support to the industry; a lack of qualified veterinarians, dedicated specialists i.e. farriers and stockmen to continue servicing the industry, as well as a lack of programs in education and training. Present educational programs were discussed as key factors in technology transfer.

Concern is mounting particularly by those participants working in the field involving emerging issues and diseases such as West Nile Fever, Neonatal Loss Syndrome and drug residues in slaughter horses. Their extent, demographics and potential impact on the industry were of great importance and figured prominently in the discussion of technology transfer. A need for some mechanism that would allow speedy reporting of outbreaks and availability of information on these topics appeared paramount as well as future research and development in these areas.

Committee Mandate

Through representation from the equine industry, this Committee is to identify, review and recommend priority areas of equine research and service needs by assessing current, future and emerging issues relevant to that industry.

Duties and Terms of Reference of the Committee

i) To Review equine research and service being carried out in Ontario.

ii) To discover and disclose problems requiring investigation that face the equine industry.

iii) To assess the relevance of research and service programs and suggest priorities for research efforts, especially those funded by OMAFRA, and to recommend what programs underway should be continued, expanded or terminated.

iv) To estimate the costs involved to conduct the recommended research and service programs and to supply cost benefit information if possible.

v) To supply information and recommendations in written reports to OARSC.

vi) To function through an animal species chairperson who will be appointed through OARSC. The appointment of the chair will be for a 4-year period. He or she will not succeed himself or herself, but may serve an additional 4-year period with at least a 4-year absence between each period.

State of the Equine Industry

During the past year, the equine industry has been showing modest signs of growth. In south central and western Ontario several municipalities and townships have reported increases in horse stabling and arena permits. This has been validated by antidotal information from feed outlets and veterinarians, however although it would appear that more facilities are being established this does put more concern on environmental issues. The Ontario Equestrian Federation (OEF) reports an increase in an increase of membership and licensing of registered horse shows.

The racing sector continues to lead the industry with a continual increase to purses as well as many existing tracks undergoing renovations and developing strong marketing campaigns, this despite some reports that the betting handle is down. Another new facility is due to open in Elora, moving from their old facility in Elmira. There is a strong demand for racing stock, which has placed pressure on the veterinary and farrier care to keep these animals serviceable.

We are now seeing healthy increases in sale numbers and revenue in both the standardbred and thoroughbred sector, both early sales reporting increases with the yearly standardbred sale in London, Ontario this fall reporting record prices. This is a healthy indicator of growth, which has been lagging since the turnaround in the industry. With the increase in purse size there had been a demand for racing animals hence a very active and profitable claiming market. Analysis would indicate that this area is becoming exhausted and the industry is turning to the yearling market for replacements. This has encouraged interest and investment in breeding stock and the breeding industry in general.

The feed industry reports sustained growth with demand for equine feed stuffs being steady with an increase in interest of varying feed products and nutritional education by the equine consumer.

Some areas of interest pertaining to technology transfer are the last educational initiatives within the industry. There has been the development of an online equine science certificate program by the Equine Research Centre (ERC) in conjunction with the University of Guelph and the Agricultural Adaptation Program. The ERC has also been involved in developing other programs along with industry groups to provide seminars and symposiums to their sector. This seems to be one of several beneficial outcomes from the new alliance between the ERC and the University of Guelph.

OMAF, through the Extension Office, continues to provide transfer via 'Horse News Views' info (fact sheets), articles and presentations. The University of Guelph through the veterinary and agricultural college continues to provide both material and personnel for info sheets, articles, seminars, presentations and scientific meetings.

Equine Service Priorities and Recommendations

Members of the Committee were content with the report of priorities and projects under way. With the introduction of West Nile Virus in the equine population last summer, emerging diseases and nutriceuticals still seem to be hot issues. Although the Committee felt confident that many issues are being managed under the present priority system, certain work should be encouraged in these areas as well as reinforcing the need for pertinent up to date data on demographics and disease outbreaks. The issue of drug residues is of increasing interest and has been added to the emerging issues list. The Committee did recognize that with certain disease outbreaks gearing up for research in these areas might be time dependent.

One issue raised during project discussions was the comparison of industry-matched dollars between equine and other species. It was noted that dollars from food safety government institutions is classified as industry sponsored money when matched with OMAF funding. However, the equine sector is not eligible for this money. The food safety initiative funding from different government programs is available for most other species groups other than equine. It was the Committee's understanding that these amounts are considered as industry funding when matched with OMAF funding.

The Group was impressed with the new ERC educational programs and felt this was a good model for technology transfer, which could greatly service the industry. A lengthy discussion on technology transfer brought several issues to light, one being the need for a central portal for the gathering and dissemination of information. This portal would act as a brokerage house for information and programs emanating from within the OMAF and university program as well as involving industry to provide a conduit to the horse public.

It was satisfying to note that one of the Committee's recommendations from last year has been fulfilled with the appointment of an equine nutritional physiologist to the department of nutrition.

Recommendations

1) Adding drug residues in slaughter horses to the emerging issues list as well as encourage research into emerging diseases and their outbreak. Action: To promote and call for projects in this area via the equine species coordinator.

2) Better efforts need to be made to improve the reporting of emerging issues and disease outbreaks through OMAF extension. Action: Letter to ministry outlining the need for such an action.

3) That an accounting system be introduced to demonstrate the actual amounts of funding for projects from within and outside OMAF as well as showing differences in availability and eligibility from different funding agencies. Action: Letter to the Equine outlining this recommendation.

4) Supporting and endorsing the efforts of the ERC, University of Guelph and industry, (Horse Health Institute HHI) to lobby the Ontario Racing Industry Association, the Ontario Racing Commission and different government bodies to provide monies for Equine research and infrastructure based on a percentage of slot revenues. Action: To support this initiative and recommend to OMAF that this be an item for discussion with the appropriate ministries.

5) Recognizing and endorsing the educational programs initiatives instituted by the ERC and encourages other organizations to support this and implement other similar mechanisms in the future. Action: To inform the different equine industry associations of the availability of these courses and the ability of the ERC and the University of Guelph to provide educational programs to meet their specific needs.

6) That researchers and staff be made available for technology transfer to different organizations and industry groups. Action: Letter to species co-ordinator explaining the importance of technology transfer to the ongoing support of projects and the encouragement of availability of researchers and staff to ongoing finding.

7) The development or maintenance of programs to train skilled equine trade i.e., farrier's training. Action: Letter to Ontario Farrier's Association for support and request for representation on OARSCC Committee. Letter to OMAFRA and ED minister.

8) That there be a central 'clearing house' that would be a liaison for technology transfer from research and projects to the public and industry that would provide:
A contact for inquiries with regard to different research and equine health concerns presently addressed by the university and other institutions.

A synopsis for the pertinent facts and results of research and projects that have been complete and ongoing, and take the technical data from projects and synthesize these into an intelligent form for the horse person. A contact for organizations interested in educational opportunities pertaining to specialties or information within the university and OMAF. A centre that could collaborate with researchers to provide industry education. Action: Recommend that the ERC (HHI) take this initiative.

Goat

Goat Subcommittee

Executive Summary

The Ontario Goat Research and Services Committee met on October 29, 2002 to identify "technology transfer" recommendations for the Ontario goat industry and update the "research" recommendations submitted to the Ontario Animal Research and Services Committee (OARSC) in 2000 and 2001.

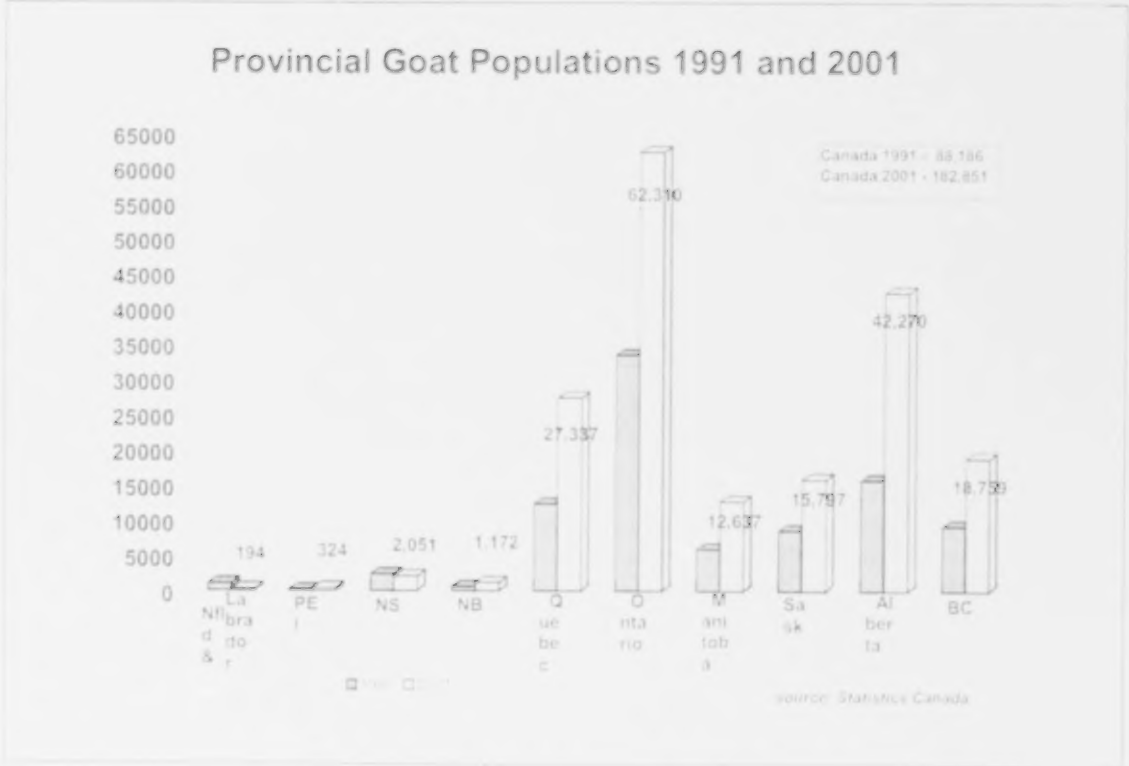
Technology Transfer recommendations identified by the committee are nutrition, health management, marketing, milk quality, production systems, and genetic improvement.

Mandate

- To review goat research and services being carried out in Ontario.
- To identify problems facing the goat industry requiring investigation.
- To assess relevance of research and service programmes and suggest priorities for new research.
- To recommend the expansion or termination of programs already under way.
- To assess programs on a cost benefit basis.
- To liaise with researchers and producers on the progress of research and services.

State of Industry Report

Data from the 2001 Agriculture Census indicate that significant growth has occurred in the goat industry. Most provinces have shown significant increases in numbers of goats. Total number of goats in Canada were 182,151 head, an increase of 45.3 percent from 1996's total of 125,818 head. The graph below shows the changes in the numbers of goats by province in the past 10 years. Although not shown in the graph, the number of producers has declined slightly in the past 10 years. Average national herd size has increased by 56 percent.



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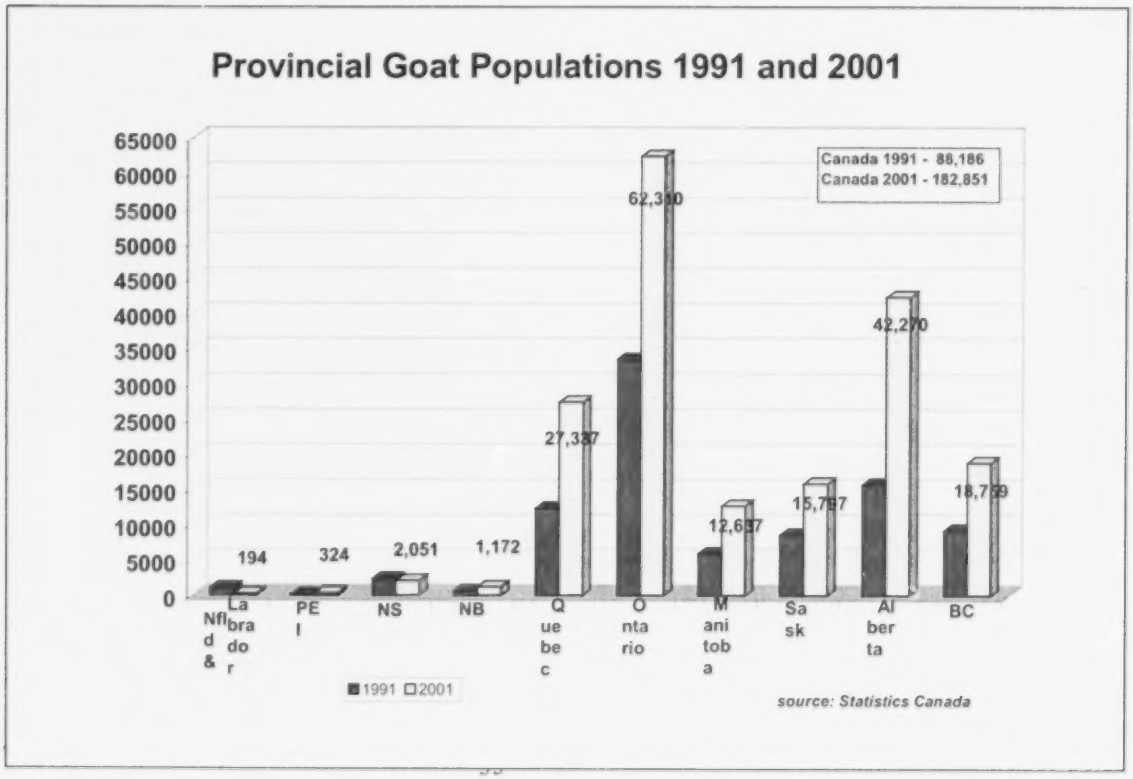


Meat Goat Sector

Slaughter Statistics

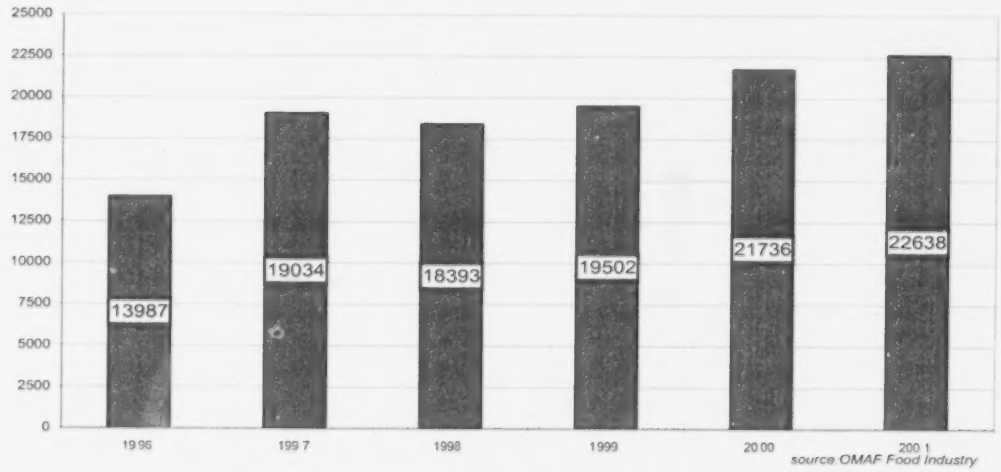
Provincial slaughter continues to gradually increase as is shown in the graph below. Slaughter in 2001, at 22,638 head, was 4.1 percent higher than 2000's slaughter of 21,736. During the first 9 months of 2002, 17,026 head of goats were slaughtered, representing an increase of 16.5 percent compared to the same period in 2001. The following table shows the change in goat slaughter over the past six years.

Yearly Provincial Goat Slaughter in Ontario (head)

1996	1997	1998	1999	2000	2001	2002*
13,987	19,034	18,393	19,502	21,736	22,638	17,026

*January to September 30 2002 SOURCE: FOOD INDUSTRY DIVISION, OMAF

Yearly Provincial Goat Slaughter (head): 1996 - 2002



Imports of Goat Meat Into Canada

Imports of goat meat into Canada declined by 14.6 percent during the year of 2001. To December 31, 2001, 755,991 kilograms of goat meat entered Canada, down from 884,726 kilograms in 2000.. Australia continues to supply the largest portion (92.5%) of goat meat imports. In the late 1980's and early 1990's, New Zealand was our major supplier of goat meat, but was surpassed by Australia in the mid 1990's.

Imports into Ontario account for 89.0 percent of total imports during 2001. This hase varied from 47 to 75 percent of total imports during the past five years.

A very small volume (105 kilograms) of goat meat was imported from the United States. This is the first importation from U.S. since 1997 when 35,018 kilograms were imported.

The value of goat meat imports represented 2.4 million Canadian dollars in 2001 compared to 2.8 million Canadian dollars in 2000. Average price per kilogram has increased to $3.23, compared to $2.48 in 1995.

Volume and Value of Goat Meat Imports into Canada, by Country

	New Zealand (kgs)	Australia (kgs)	Total Wt (kgs)	Value Cdn $$	Value Per Kg
1995	163902	1041341	1205243	2991535	2.48
1996	149695	574556	724251	1989570	2.75
1997	306951	705092	1047061	3034510	2.90
1998	191611	589601	781212	2456074	3.14
1999	110615	562195	672810	2102801	3.13
2000	100956	783770	884726	2806900	3.28
2001	56871	699120	755991	2438955	3.23
2002*	37338	569778	607221	1870450	

*to August 31, 2002 SOURCE: STATISTICS CANADA

Ontario Market Prices

Industry participants report that prices during 2001 have remained fairly stable compared to 2000. Boer, Nubian, and their respective crosses continue to attract premium prices, of up to $15 per kid higher than dairy-type kids.

Dairy Goat Sector

The commercial goat milk industry continues to enjoy rapid growth. Total number of licensed producers shipping milk has increased from 180 in 2000 to 223 this year.

According to Ontario Goat Milk Producers' Association (OGMPA), there are currently 13 processors licensed to use goat milk in the province. OGMPA also estimates that over 10 million litres of goat milk was processed during 2001. Supply continues to fall short of demand.

Producers shipping to the largest buyer of goat milk are being paid based on milk butterfat and protein levels since March 2001. This has resulted in an increase in the average price per litre.

Cheeses remain the number one product being processed from goat milk, with new and regular varieties being produced. The remainder of milk is processed into yogurt, ice cream, butter, powdered milk and fluid milk. Currently, three of the 13 processors package fluid milk. OGMPA reports that, although the majority of consumers still drink goat milk for health reasons, such as food allergies, an increasing number are attracted to goat milk's natural image and reputation. OGMPA stresses the importance of this image not being compromised.

Imports of Cheeses

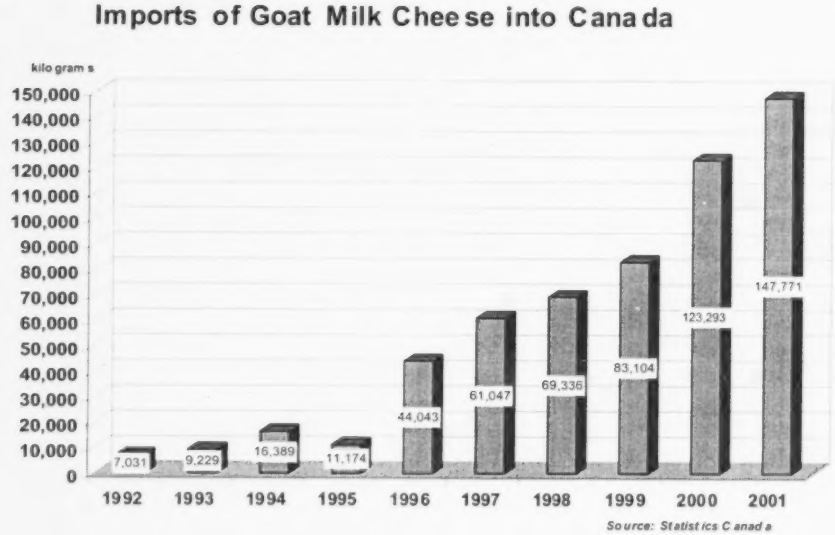
Canada continues to import a considerable amount of specialty cheeses into the country. Import data for cheeses are reported by variety – one of which is specifically goat's milk cheese. From the table below, one can see the dramatic increase in importation of goat milk cheese (double that of 1997 and 13 times more than in 1993!!). Although not indicated in the statistics, we can assume that some portion of varieties

like **feta, the cream cheeses, soft cheeses, and some of the hard cheeses** is also goat milk product. What that portion represents, is difficult to assume. The following table provides figures for imports of goat milk cheese and "typical" varieties of which some portion may be goat milk cheese.

Table 1: IMPORTS OF SOME VARIETIES OF SOFT & FRESH CHEESES

	Kilograms									
Variety	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Goat	7,031	9,229	16,389	11,174	44,043	61,047	69,336	83,104	123,293	147,771
Feta	676,954	708,571	799,493	765,340	679,530	722,274	588,401	764,188	740,975	790,167
Romanello	2,000	7,000	2,000	2,000	-	-	-	-	-	
Crotenese	163,105	222,185	164,245	61,526	-	-	54,103	80,634	47,006	24,459
Ricotta	12,103	15,256	17,376	12,564	-	-	13,622	8,299	20,296	12,560
Romano	414,133	427,362	402,281	514,735	1,562,089	915,829	234,464	278,398	267,579	351,148

SOURCES:CANADIAN DAIRY COUNCIL & STATISTICS CANADA



Fibre Sector

As with all natural fibres, price for mohair remains low, but was somewhat stronger during the past year compared to previous years. Those producers who sell direct to mills or consumers, or have it processed and return to them for cottage industry production, are generating somewhat better returns. However they are finding it discouraging to raise fibre goats, use their mohair to make yarn at a mill in Canada and have to compete with the yarn imported from Bradford,England which sells at 1/2 the cost of processing here in Canada. It is getting more difficult for producers to find processors who will process mohair and return to the producer their own fibre.

One processor in Quebec was offering to buy Canadian mohair at the following prices in April 2001:

- Kid 1st clip,(male and female): $8.40/lb
- Kid 2nd clip,(female): $8.10/lb
- Yearling(male 2nd,female 3rd& 4th) $5.00/lb
- Young Adult(female 5th,6th & male 3rd) $3.40/lb
- Adult(female 7th & up) $2.90/lb

There is also an opportunity to send mohair to Canadian Cooperative Wool Growers in Carleton Place, and then have it sold on the world market.

Technology Transfer Recommendations

Current "technology transfer" to the goat industry in Ontario is provided by OMAF, Ontario Goat Milk Producers' Association, Ontario Goat Breeders' Association, private veterinarians and industry representatives to the Ontario goat industry.

The committee identified six priority areas for technology transfer. The committee identified the first four priorities listed below as higher priorities. The final two were ranked as medium priority.

1. Nutrition

Nutrition continues to be the number one focus for new entrants and existing producers, as feed costs represent at least 65 percent of total costs of production. Areas that need particular emphasis include nutrition of the breeding and milking herd; nutrition for optimal growth in replacement females; nutrition for improved growth and feed efficiency in market kids and nutrition of kids during the milk-feeding period.

2. Health management

Newly purchased herds are often compiled from a number of different herds, each with its own set of health issues. Producers need continually updated information on how to manage production limiting diseases; the impact of housing, ventilation and stock density on herd health and its management; overall basics in herd health management and on-farm biosecurity protocols.

3. Milk quality / Mastitis

Over the past few years, producers have attempted to maintain milk quality despite irregular and lengthy time intervals between samples and reporting of results to producers. OMAF has been working with producer groups, processors and Laboratory Services Division to improve results reporting. As well, an intensive sampling program was initiated in September, 2002 to help identify key components of a sampling / reporting process that will work efficiently for Ontario goat milk producers. Rapidly expanding milk production can result in increased market share of high quality products if milk quality is regularly monitored and improved. There is a need for current information on regular milk equipment maintenance; milking procedure for quality milk; and mastitis prevention and control, and how mastitis impacts on milk quality and production.

4. Marketing

Meat goat producers strive to obtain the best returns possible when marketing the meat kids. Decisions on timing of marketing impact greatly on price received. Detailed market price reporting (breakdown by weight categories and age) is an extremely useful tool to make informed marketing decisions. As well, there is a need for information on current regulations dealing with slaughter and farm-gate sales. Information on other aspects of marketing, including Ontario's diverse chevon consumer base, need to be continually updated and maintained.

Transportation costs are proportionately higher for goats & sheep compared to beef cattle.

5. Production systems / Housing

Chevon (goat meat) and milk are in demand year-round. Most goats are seasonal breeders, meaning that they generally breed in the autumn and kid in the late winter, early spring. To maintain, and expand year-round markets, adjustments to production systems are necessary so that goats can also be bred in the spring and summer months. As well, productivity targets and economics of the different production systems need to be compiled.

Information providing options for on-farm deadstock disposal is needed. Goat producers, along with sheep and deer producers do not have access to the deadstock services enjoyed by cattle and swine producers.

Many goats are housed in buildings designed and built for other species. To ensure health and productivity, renovations need to be done based on specific needs of goats including space allocations and ventilation. Literature needs to be reviewed and recommendations compiled that are suitable under Ontario conditions.

The largest labour requirement on dairy goat operations is the milking procedure – including animal "delivery" to and from the parlour. There is a continued demand by producers to acquire the best current design specifications for new and renovated facilities.

6. Genetic improvement

Production costs can only be offset by improved production (better growth rates and higher milk production), or better prices. Improving production relies on selecting "superior" animals to include in future breeding programs. Identifying these "superior" animals can only be truly achieved with performance programs. Current programs for meat goats are non-existant. Those for dairy goats are costly. The cost per test is the same regardless of animal type, so cost per goat per year is the same as cost per cow per year, resulting in non-affordable cost per litre of production. Very few commercial producers can justify this cost, even though they recognize the benefit these programs offer from a genetic improvement standpoint. Existing programs need to evaluate cost-benefit analysis of reducing number of tests required per lactation, and attracting more producers to participate in these programs.

Issues (from 2000 report)

1. Ability to produce milk economically

Feed costs represent 65 percent and higher of total costs of production for most ruminant livestock operations. Dairy goat production is rapidly increasing in size in Ontario. Little, if any work is being done to develop and evaluate feeding programs, that not only improve milk production, but also improve the bottom line, or profit of the operations. Some processors plan to begin payment on milk components rather than volume. Very little Ontario data is available on influence of feeding programs on milk components.

Gaps/barriers/deficiencies/opportunities:

- Producers, and feed industry personnel interested in dairy goat nutrition, generally are working in isolation in any attempts to fine tune feeding programs for improved production.
- Individual producers cannot afford to bear full cost of experimentally changing feeding program in an effort to determine optimum feeding level/ cost for most economical returns.
- Compilation of nutrition research results that may be applicable to Ontario conditions is needed.
- Co-ordinated on-farm feeding trials, based on forage quality and different energy/protein levels, to determine optimum production and cost per litre of production would benefit producers, and feed industry in developing effective feeding programs.

2. Management of abortion agents – particularly enzootic and Q-fever

Abortion problems continue to affect a large number of goat herds, resulting in lost revenue through decreased milk production per doe, reduced kidding percentages, and increased cull rates. Two abortion agents of particular importance, are enzootic abortion and coxiella (Q-fever) abortion. Both of these are zoonotic, and can pose serious human health concerns. Currently, there are no vaccines available to use to prevent outbreaks of enzootic abortion. Research is needed to evaluate efficacy of vaccines currently available for other ruminants, to develop effective vaccines for use in goats, and explore effectiveness of other preventative measures.

Gaps/barriers/deficiencies/opportunities:

- No enzootic abortion vaccine is available for use in goats
- Efficacy of vaccines for other ruminants is not known

3. Benchmarks for economics of production

Few goat producers participate in data collection programs such as OFMAP (Ontario Farm Management Analysis Program). As the industry expands, financial lending institutions seek reliable financial benchmark data for risk assessment of loan requests. Without these data, they are often reluctant to loan money for establishment of new enterprises, or expansion of existing ones. Producers have no data to compare their own performance to (except their own from previous years) in identifying those areas of the enterprise that need improvements to remain as profitable as possible.

Gaps/barriers/deficiencies/opportunities:

- Current benchmarks are based on estimates not actual data
- Participation by producers has been poor in the past
- Lending institutions request this sort of information regularly, when evaluating loan applications

4. Affordably priced genetic improvement

Dairy goat producers have two genetic (milk recording) programs they can participate in. Both of these are based on a set number of tests per animal per year. The cost per test is the same regardless of animal type, so cost per goat per year is the same as cost per cow per year, resulting in unaffordable cost per litre of production. Very few commercial producers can justify this cost, even though they recognize the benefit these programs offer from a genetic improvement standpoint. Existing programs need to evaluate cost-benefit analysis of reducing number of tests required per lactation, and attracting more producers to participate in these programs.

Research inventory/current activities:

- Investigation of the Practicality and Application of Embryo Transfer Technology For Commercial Goat Production in Ontario

Gaps/barriers/deficiencies/opportunities:

- cost per test, and required frequency of testing make these programs unaffordable to the average commercial producer.
- Very little genetic improvement has been made in average production per goat in Canada in the past 10 years.
- Other major goat milk producing regions of the world have milk recording/ genetic improvement programs based on fewer tests, resulting in more affordable programs, and increased participation. Similar changes to Canadian programs need to be evaluated.

5. Safety Net R & D – allocation of funding

Currently, goats are not represented in allocation of funding for research and development, but must rely on the listed commodities to agree to ear marking some of the dollar allocation for goat projects and research. Since the goat industry is one of the few livestock commodities that is showing strong economic growth, being listed as one of the regular commodities that receive funding would ensure much needed research could be partially funded from this source.

6. National Identification and On- farm food safety program

The two goat organizations in Ontario recognize the importance of National Identification and Canadian On-farm food safety programs in maintaining consumer confidence and, access to markets outside the country. Neither can participate in the manner they wish, because of lack of funding. Both organizations have no formal funding source, so rely on their executive and dir ctors to represent the organizations on a volunteer basis. With no check-off program in place to help pro ide funding, they have no available dollars to participate in these programs, to ensure components ar developed with the interests of the goat industry in mind.

Gaps/barriers/deficiencies/opportunities:

- Neither provincial organization has available funding to participate in these important programs
- On a national level, few other regions of the country with producer organizations have any source of funding either

7. Environmental Issues- manure and deadstock

Legislation will have a big impact on general farming practices in the next five years. Many different environmental issues will need to be investigated as society becomes more sensitive to environmental issues.

Gaps/barriers/deficiencies/opportunities:

- Livestock producers need research performed so that the impact of livestock agriculture on the environment can be based on scientifically derived information.
- Goat producers in particular need specific methodology and information so that manure and deadstock are handled in the most environmentally friendly manner. Manure needs to be analyzed to determine appropriate application rates and whether changes such as nutrition will alter the manure nutrient content to make it more environmentally friendly.
- Deadstock disposal is an issue because of risk to water sheds and control of canine predators.
- Methodology for deadstock disposal is needed that will protect the environment and ensure that disease is not spread.
- It is hoped that much of the work with disposal of sheep carcasses can be applied equally in the goat industry

Services (from 2001 report)

Services available to the goat industry are limited when compared to those available to other livestock commodities. Those services currently available to the goat industry include: real time ultrasound pregnancy scanning, laboratory diagnostics, veterinary services, nutritional services and provincially inspected slaughter.

Threats

Increased restrictions from rendering industry is affecting custom freezer trade. More small, rural abattoirs are refusing to kill sheep & goats because of difficulty with offal disposal from sheep, goats and deer.

With the move to more cost recovery by the Animal Health Diagnostic Labs, producers are discouraged from utilizing available services. This is detrimental to solving flock health problems. There is also concern that with reduced levels of use of lab services by producers, the effectiveness of using diagnostic results in early detection of diseases for surveillance programs is also reduced.

Goat industry association regulations with respect to animal registrations impede uptake of available technologies. Currently offspring born from breedings using on-farm collected semen currently cannot be registered.

Weaknesses

Because of the relatively small size of the goat industry, resources to finance identified needs is very limited. None of the goat industry producer associations have a regular source of revenue, relying on membership fees and volunteers to run their organizations.

Few producers use the current milk recording program, stating that it is very costly. The result is a limited ability to identify those animals with "superior" genetics for higher milk production, and extremely slow genetic progress for such economically important traits. Currently, there is no genetic program for meat goat improvement.

With limited coverage in vet courses on goat health and herd management areas, few graduating veterinarians have any background or experience in goat health management. There is a need for post-graduate training courses to enable veterinarians with goat producer clients to upgrade their knowledge and skills.

Opportunities

Opportunities for providing services to the goat industry are endless. The industry has been under-serviced in many areas that other livestock commodities take for granted such as those services offered by nutritionists, veterinarians, genetic / AI companies etc.

Pork

Pork Subcommittee

Executive Summary

This report summarises the activities of the Ontario Pork Research and Services Committee.

This year the committee was asked to focus discussions on Technology Transfer. The continued use of traditional means of information dissemination (print and oral communication) was identified as essential for effective Technology Transfer since new methods such as the Internet are not options for many in the agricultural sector at this time. The important roles of the University of Guelph and OMAF were discussed. OMAF is seen to have a unique responsibility in Technology Transfer in the province.

There are a number of research priorities identified in the 2000 Strategic Report that require emphasis. These are: human health in relation to agricultural working environments, and the potential economic impacts of a foreign animal disease outbreak, the Country of Origin Labelling legislation in the US, and Ontario's new Nutrient Management Act.

Committee Activities

The Committee met on 30th September 2002 at 1 Stone Road, Guelph.

The Committee is made up of representatives from a cross-section of the pork industry. Dr. Ernest Sanford has agreed to join the committee as co-chair. Some members have fulfilled a 4-year term, and the need for replacements for those individuals and for additional members to represent other sectors of the industry are being addressed. Appendix A contains the current membership list.

In past years it was suggested that the committee should have a vision statement to guide its activities. After discussion, the following was generally agreed to:

"A prosperous pork industry in Ontario that is economically, environmentally, socially and ethically sustainable."

The Managing Director of the Ontario Pork Industry Council (OPIC), Ingrid Chyc, made a presentation to the committee, outlining OPIC's issues committees structure, its role in information dissemination, and a proposed OPIC Research Committee. The committee recognised that the latter, together with OPIC's existing committee structure and industry membership, could be very effective in providing broad, grass-roots input into the research community about challenges and research priorities, and in making refined and specific recommendations about research needs. These recommendations could be put forward for the consideration of those agencies guiding or funding research.

State of the Industry

Pork production is a significant contributor to economic activity in Ontario, with over 4.7 million hogs marketed in 2001 (Tables 1). Over 1.7 million pigs were marketed outside of Ontario in 2001 (Table 2).

Table 1. Ontario Swine Industry

	1997	1998	1999	2000	2001	2002
Number of Pigs on Ontario farms ('000 head)[1]						
Boars (> 6 months)	15.7	15.3	13.9	13.5	12.6	13.0
Sows and bred gilts	320.6	340.1	335.2	344.5	360.5	370.7
Pigs (under 20 kg)	944.2	1,057.3	1,037.2	1,045.0	1,026.5	1,027.1
Pigs (20 to 60 kg)	990.2	1,106.9	1,081.2	1,141.2	1,163.5	1,145.8
Pigs (over 60 kg)	864.4	909.6	933.7	990.3	936.9	1,053.5
Total Pigs	**3,135.1**	**3,429.2**	**3,401.2**	**3,534.5**	**3,500.0**	**3,610.1**
Ontario Farms Reporting Pigs[1]	6,530	6,250	5,550	5,250	4,900	4,750
OPPMB Producers[2]	6 068	5 502	5 099	4 473	4 400	
OPPMB Market Hog Sales[2]	3,815,521	4,376,490	4,700,121	4,563,045	4,747,442	
Average Market Hog Dressed Wt. (kg)[2]	85.60	86.40	87.60	88.35	89.19	
Average Pool Price ($/100 kg, 100 index)[2]	186.69	121.42	120.40	162.03	173.04	144.00[3]
Corn (farm price, $/t)[4]	151.58	130.14	114.71	116.18	132.91	
Soybean Meal ($/t)[4]	442.47	304.71	264.91	318.60	331.75	
Estimated Net Return ($/hog, farrow to finish)[4]	19.13	-23.21	-16.89	19.70	31.52	

1. October 1st. Livestock Statistics, Statistics Canada.
2. Ontario Pork.
3. Average for months of January – September 2002.
4. Data and calculations from OMAF Hog Market Facts compiled by John Bancroft, OMAF.

Table 2. Calculated Pig Production in Ontario ('000 head)[1].

	1996	1997	1998	1999	2000	2001
Pigs Processed within Canada[2]	3,582	3,455	4,030	4,841	4,771	4,944
Feeder Pig Exports	254	357	586	628	793	1,279
Market Pig Exports[3]	711	975	1,007	484	463	483
Total Pig Production	4,547	4,787	5,622	5,952	6,027	6,707

1. From "Ontario – Yearly Hog Market Facts" compiled by John Bancroft, OMAF. Sources: Statistics Canada; Agriculture and Agri-Food Canada. "Exports" means exported outside of Canada.
2. Includes market hogs, sows, and boars.
3. Includes market hogs, sows, boars, and breeding stock.

Feeder pig exports account for much of the overall gain in pig production. In 2001, live exports amounted to about 26% of pig production. Generally, pig production is increasing at a moderate rate in Ontario. In terms of land base, feed production, and market prospects, Ontario has capacity for expansion of hog production. It is expected that pork production in Ontario will show a moderate increasing trend over the coming years. The available statistics on sow numbers and hog production suggest that the productivity of Ontario sows has improved by 30% over the last decade. This improvement reflects advances in management, genetics, housing, health, and production efficiency, which have been made through efforts in research and technology transfer.

The Canadian Quality Assurance (CQA) program is being implemented, with 2,331 Ontario producers currently reported to be recognised as Canadian Quality Assured, accounting for annual sales of 3.4 million hogs. Over 3,7 producers are enrolled in the program, with estimated annual hog sales of over 4.0 million (Ontario Pork).

Ontario Pork has initiated the creation of a GIS database of all swine production sites in Ontario. A team from the University of Guelph will create the database, which will be used to improve response to herd health challenges or natural disaster emergencies, for example.

In an industry with great dependence on export markets, international competitiveness and border access are always critical. Foreign animal disease threats and the US Country of Origin Labelling policy are two principal issues at this time. Restrictions to the availability of medicines used in production, or increased costs of acquiring or using these products, raise concerns about competitiveness of production in Ontario.

The involvement of the retail sector in determining production standards (i.e. welfare) and slaughter procedures in the US is an emerging issue.

There are concerns about changes in the administrative structure of Agriculture Canada and its potential impacts on research and research facilities.

There is increasing interest in group housing of dry sows, which leads to a need for clear information on dealing with the challenges that arise.

Review of Research Priorities

The committee reviewed the recommendations and priorities outlined in our Strategic Report submitted in 2000. These remain our recommendations and priorities for 2002. Appendix B holds the relevant text from the Strategic Report. Several specific topics were discussed, and existing objectives highlighted in view of emerging issues, as follows.

Legislation with respect to medicine usage or availability relates to existing objectives under the prioritis of Pork Quality and Safety and Production Efficiency for a Continued Competitive and Viable Industry, respectively:

> *"To develop strategies and technology which will reduce antimicrobial drug use. Alternative methods of disease control such as techniques to improve immunity and the use of probiotics should be investigated. Techniques to more effectively monitor drug or chemical residues to ensure product purity are also needed."*

> *"To investigate the impact of disease and methods to control or eradicate economically significant diseases. In particular, diseases that cause reduced growth rates and weight gain variability need to be studied. Research needs to continue to improve our understanding of the pathogenesis, epidemiology, and control strategies of economically important diseases. Emphasis needs to be placed on monitoring and biosecurity."*

Product traceability looks to be an upcoming competitive and potentially regulatory issue. It would be ideal to be able to trace a retail cut all the way back to the place of birth of the source animal, with accompanying documentation, proof, etc. It may be necessary to identify priority areas first, with the caveat that short-term solutions to problems at specific points in the production chain may not fit into a comprehensive solution for the whole production chain. This relates to existing objectives under Competitiveness and Pork Quality and Safety.

The committee proposes to send a memo to the Agricultural Economics Committee recommending that research is needed into the economic impact of regulations or policy on Ontario's pork industry, particularly the US Country of Origin Labelling policy and potential regulations related to traceability, animal welfare, or environment (e.g. the Nutrient Management Act). The costs of production related to these issues would have bearing on the viability of the pork industry by affecting profitability and international competitiveness. It was noted, for example, that the cost of additional regulations is a factor in the collapse of animal production in the UK.

The challenges arising from the group housing of dry sows include: the physical structure of group housing, group sizes, social dynamics such as aggressive and submissive behaviour, and feeding, etc. These items represent research needs, and are covered under the existing objectives of Production Efficiency and Competitiveness, and Improved Animal Well-Being.

The rest of this section is restated from last year's report.

The 2000 report emphasised the need for research into the safety of pigs and people on farms. Goal 1.4 from the 2000 Strategic Report states:

"To evaluate the safety of pigs and people. Specifically there is a need to investigate techniques to reduce the health risks associated with manure gases such as hydrogen sulfide particularly at the time of manure removal. Health concerns such as the long-term inhalation of barn dust by farm workers needs to be investigated."

There is a need for research regarding working conditions for employees in agricultural operations, in order to ensure that we can protect their health and well-being. Farm workers are major contributors to the success of the industry. Rural residents are also beginning to show concern about the health implications of living near large agricultural operations. There is a clear need for leadership in research to assess risks and, eventually, to establish acceptable standards. Agriculture is currently exempt from the Occupational Health and Safety Act, but as farms become larger and employ more people, there may be pressure to make the industry comply. Application of standards from other industries to agricultural operations may not be sensible, but this could happen if standards specific to agriculture are not available. It was noted that human health and safety includes mental health and coping with stress.

OMAF provides research as a "service" to the agricultural industry. The partnership with the University of Guelph creates an infrastructure that allows research to be done for private industry and commodity groups which otherwise might not be done. In many cases, it leverages the effectiveness of private company or commodity group research funds. There needs to remain in place a broad, flexible research program in order to balance the need for long-term research objectives and the need to respond to emerging issues.

Technology Transfer

The September 4th Technology Transfer seminar was reviewed, including the suggested definition of Technology Transfer:

> *"The dissemination of information to facilitate the efficient and timely adoption of beneficial technologies and management practices on Ontario livestock and poultry farms."*

Technology Transfer is necessary for the continued success of the industry but the speed and effectiveness of Tech. Transfer in Ontario needs to be improved. Delivery needs to be varied; written sources or face-to-face (which does not necessarily mean one on one) are preferred by the target audience. Time and accessibility are important factors for producers. The WWW is a great medium for a few, and somewhat useful for some, but simply not an option for many. In time the Internet will surely develop as a primary means of information dissemination, but at this time it has limitations and other options must be available.

Valuable research is done in Ontario and the rest of Canada. Our research should provide a competitive advantage for all Canadian producers, but Tech. Transfer must be done rapidly before either the research is dated or the advantage is lost. It was noted that sharing of research between provinces should be increased, especially federally funded research from federal stations. As an example, it was suggested that dissemination of research results from the Lennoxville station to all provinces equally in both languages could be improved; the suggestion was that little makes it outside of Quebec and French-speaking New Brunswick into the rest of Eastern Canada.

University of Guelph faculty have a mandate for Tech. Transfer, which often takes the form of technical or scientific publications accessible to some sectors of the industry but not (generally) the producer base. It was suggested that the dissemination of information in usable forms could perhaps be maximised by improved connection with OMAF Technology Transfer staff. It was stressed that information should be readable and concise.

There is a need for co-ordination of Tech. Transfer efforts among stakeholders; the **"Spotlight on Swine": Strategic Program Review and Planning Session** held November 29, 2001, organised by OMAF as a day of interaction with industry stakeholders, was a beginning. Also, participants at the September 4th meeting were provided with a summary of the year's program plans developed by OMAF's Livestock Technology staff.

Veterinarians, company reps, consultants and others play roles in dissemination of information, but OMAF is seen, and must continue to serve, as an unbiased source of information to the Ontario pork industry and the consumer. It was suggested that OMAF has a unique responsibility for Technology Transfer in Ontario. In particular, OMAF is uniquely responsible for bringing information into Ontario from outside of the province, by communicating and forming working relationships with people in other areas, attending out-of-province conferences and meetings, searching out published information, etc. This role should predominate over the dissemination of information originating within Ontario – there are other mechanisms in place to contribute to this. It was noted that existing vehicles (e.g. Pork News and Views, OMAF website) are very good, but the content should more often extend beyond Ontario sources, including inviting contributors from outside. It was suggested that OMAF staff need to make themselves better known across the province as experts in a particular field (over and above a general job title), rather than just their home regions. That is, they need to build higher profiles in order to attract attention and to stimulate clients to search them out as sources of information.

It is difficult to assess the success of Tech. Transfer. Who can answer questions such as the following: How well is Tech. Transfer being done in Ontario? How does it compare with the model of two decades ago? How does Ontario's success compare with other jurisdictions? How are jurisdictions getting along when changes have been made to

government extension models or Tech. Transfer – are other players filling gaps, and how is agriculture there progressing?

Poultry

Poultry Subcommittee

Executive Summary

The three poultry subcommittees met as one group for a full day meeting on September 24th, 2002 at the Kay House, Arkell. The poultry committee discussed the development of reports and decided that as the technology transfer provided for each of the three sectors were similar, it would submit one report after a general meeting and discussion.

Therefore the following comments represent the consensus of the three poultry subcommittees, Broilers, Egg Layers and Turkey and are respectfully submitted by the three chairs: Dr. Rachel Ouckama, Dr. Peter Hunton and Diane Spratt.

Review of Progress on Service Priority Recommendations 2001

Priority #1: Development of benchmarking capabilities focused on Food safety.

A benchmarking survey was produced by OMAF and sent to Chicken Farmers of Ontario producers. The questions covered three areas: management, heat stress and food safety practices and resulted in a good return rate. The results are currently being compiled.

University of Montreal is embarking on a major surveillance project to provide baseline data on the bacterial load of poultry as they enter the slaughter facility.

Priority #2: Poultry Health, Diagnostics and Disease Surveillance.

A success story: in the development of real time PCR for low path Avian Influenza virus diagnostics now available at Guelph. Similar technology for Infectious Bursal Disease virus and Infectious Bronchitis virus has resulted in faster, more accurate diagnostics and the ability to fingerprint and trace family relationships for emerging viral subtypes.

Overall industry is still concerned that cost cutting at the Animal Health Lab, Guelph will impact negatively on the poultry service area with serious consequences for the industry.

Livestock Medicines Education courses are proceeding with 17 poultry courses completed in 2002 and 349 participants certified.

The GPS project to map all poultry producer operations in the province is underway preformed by the commodity boards. The Ontario Egg producers survey is complete, Chicken Farmers of Ontario and Ontario Broiler Hatching Egg and Chick Commission is in progress. Ontario Turkey producers Marketing board is in the planning stages. There is a need for a central system to assign codes, compile/overlay information from various boards and coordinate in an outbreak situation. A trip to North Carolina has been arranged by Poultry Industry Council with OMAFRA, CFIA, veterinarians, and commodity board representation to investigate their mapping programs, laboratory

methods and coordination team structure in response to the recent low path Avian Influenza outbreak.

Priority #3: Nutrient Management and Planning.

The survey and sampling project to establish benchmark data for manure analysis and volume production was conducted by the Ontario Egg Producers on 104 premises and by the Ontario Broiler Hatching Egg and Chick Commission on 40 premises. Data will be used to better define and more accurately estimate actual output from these commodities as part of their Nutrient Management Plan.

Technology transfer is tied to these service priories in disseminating effectively and appropriately the information gathered via benchmarking reports and tracking the effect of newer management techniques, health or food safety programs and/or legislation.

Technology Transfer report from the OARSCC Poultry Subcommittees

Four major obstacles for Technology Transfer were discussed:

#1) Defining the target audience

#2) Presenting the information in a useful and practical form

#3) Trust Factor

#4) Measuring the success of the information transfer

#1) In defining the target audience it was agreed that the poultry industry is extremely fortunate and efficient in targeting the producers of the commodities. Through the quota system, all producers of that commodity are registered and well identified. This information is regularly updated for licensing and allocation reasons. The commodity boards also have very regular mailings and are very willing to include technology transfer information and updates. As a result most information sent to producers is through their producer boards and their service suppliers.

#2) Presenting the information: Internet is not perceived as the most effective means of transferring information to poultry producers for several reasons. Although producers may state that they have internet access – it may be the younger generation in the family that accesses the services and prints off hard copies of the information for parents.

Internet service is slow in the rural areas and it is believed that mail is still the most effective means of disseminating information across the province to all producers.

Email and email announcements have potential for information dissemination for a segment of the industry. At this point it will not reach as many producers as direct mail.

Much discussion arose regarding the cost and time commitment involved in screening and validating the information available on the internet. Commodity boards do not have the mandate, personnel or resources to produce a dedicated technical website. There is a possibility of expanding the Poultry Industry Council website in conjunction with OMAF if the demand arises.

#3) Trust factor: Most producers are comfortable and have a trust factor with the dissemination of information through their commodity boards. Most technology transfer through OMAF / PIC / and University of Guelph is promoted/advertised /supported and disseminated through the producer boards.

#4) Measuring success of technology transfer is extremely difficult. It was agreed that important information must be distributed by layering – or repetitive messaging through the commodity boards, service personnel and suppliers, poultry practitioners, OMAF staff and researchers. It was discussed that the poultry industry is relatively good at picking up new technology and it is hoped that with surveys that have been recently sent out to producers, more technology uptake measurements can be taken in the future once benchmark information has been gathered.

One gap that was identified and discussed during this meeting was the lack of a "Clearing House". It was mentioned that this role had very effectively been filled by Dr. John Summers when he served as Technical Editor and wrote approximately 95 factsheets and reviews through the PIC. Since this position has been empty for a few years it was hoped that with the new position being filled through the PIC and CPRC , this gap would be addressed.

Final conclusion of the poultry subcommittee:

The poultry industry of Ontario is well serviced in terms of technology transfer and there is still potential to improve, particularly with increased internet and email use within rural areas. It was agreed that Food Safety would be the most important message / technology to be coordinated and transferred to producers in the near future.

Sheep

Sheep Subcommittee

Executive Summary

The Ontario sheep industry has shown tremendous growth in the period from 1996 to 2002. This is reflected in Census data, sheep inventory data, livestock sales and slaughter data. To support this growth and to facilitate future strength in the sector, the Sheep Sub-Committee of OARSC identified technology transfer priorities in on-going and emerging issues. Those priorities include; production efficiency, health management, predation control, access to capital, National Identification, On-Farm Food Safety, environment and improving handling facilities at sales barns/packing plants. Additionally, it was identified that the research area priorities that were approved by the Agricultural Research Institute of Ontario (ARIO) must be re-visited to allow for a new strategic plan for publicly funded sheep research with consideration for the loss of the New Liskeard Agricultural Research Station Sheep Program.

State of the Industry

According to the data of the 2001 and 1996 census years, the Ontario sheep industry grew 41.6 % over that five-year period. Furthermore, the July 1st 2002 inventory indicates Ontario's total flock size has increased by 8.8 percent, although Ontario's breeding flock decreased by 2.5 percent.

Ontario accounts for 27.0 percent of the national breeding flock (219.3 thousand head of ewes, rams and replacement lambs), and is the nation's single largest breeding flock. Ontario has the 8th largest breeding flock in North America, larger than those of Colorado and Iowa. Quebec and Alberta's flocks rank 13th and 14th respectively.

Ontario accounts for 51.5% of Canada's provincial and federal slaughter. Provincial slaughter represents 96.3% of all sheep and lambs slaughtered in Ontario. Again, from a North American perspective, Ontario is the 4th largest slaughter region in North America (behind Texas) while Quebec ranks 7th.

Canada continues to export live slaughter and feeder lambs to the United States. Exports increased by 62.8% in 2001 compared to 2000. Slaughter lambs represent the largest portion of exports.

Volume of lambs through Ontario livestock auctions has risen steadily in the past four years over all weight ranges. Ontario producers continue to market the largest portion of lambs less than 79 pounds. This corresponds with the very diverse and significant ethnic market.

Technology Transfer Priorities in the Sheep Industry

The eight (8) priorities identified by the committee where divided into two groups; those addressing on-going issues, and those addressed emerging issues.

Needs to address on-going issues

1. **Production Efficiency** (***Recommendation to OABA, OMAF & OSMA***) – because the Ontario sheep industry continues to grow, much of the knowledge related to production efficiencies that are common to other industries are not available. OMAF and OSMA must diligently pursue continued technology transfer in that area to assure the industry maintains and increases upon its current 'critical mass'. Specific topics identified by the committee in this area are
   - Production modeling ("recipes") to facilitate decision making and access to capital and agribusiness services
   - Continued terminal sire identification and improvement by use of SFIP and ultrasound loin imaging, and increased use of such genetics by Forward Contract & Commercial Producers
   - Feeding systems to achieve labour and nutrient efficiency
   - Breeding strategies and management for year-round lamb production

2. **Animal Health** (***Recommendation to CAHI, CVMA, OMAF, OVC, OVMA & OABP***) – the industry continues to struggle with performance/production limiting diseases. This is a result of poor veterinary support for the industry, as well as a lack of appropriate pharmaceutical resources for sheep. Through tech transfer, recently proven strategies to control and eliminate these diseases could improve animal health and welfare as well as production efficiency. Specific topics within this area identified by the committee include:
   - Continuing education for Veterinary Practitioners
   - Developing a "Small Ruminant Veterinarian" association (such as OABP is to cattle), with OMAF providing initial leadership
   - Provincial coordination by OMAF to "connect" vets working with sheep National Scrapie/Health certification program

3. **Predation and Predator Control** ***(Recommendation to OCA, OFA, OMAF, OMNR & OSMA)*** – Predators continue to be a major cause of economic loss and producer turnover in the industry. Many of the progressive commercial producers now favour integrated predator control over compensation as a long-term solution. Producers require continued education and access to new and improved means to control predation.

4. **Access to Capital – Lender Cultivation & Flock Business Plan Development Education** ***(Recommendation to CBA – Ontario Region, OMAF & OSMA)*** – one of the bottlenecks that has been cited by the sheep industry is access to capital for all but well established producers. Baseline data economic and profitability

data must be put in the hands of lenders and applicants to facilitate good business decisions and improve access to capital for shepherds.

Needs addressing emerging issues

1. **Improving Facilities at sales barns and slaughter plants** ***(Recommendation to OIMP, OLAMA, OMAF & OSMA)*** – concerns have been raised over the design and capacity of holding and handling facilities at a number of abattoirs and sales barns in the province. The volume of lambs has increased through individual facilities, but many of these are designed and equipped for cattle, not sheep. It is recommended that OMAF & OSMA staff (or others of similar expertise in livestock handling) work with these sectors to assure adequate space and quality of handling to minimize losses.

2. **Environment/Nutrient Management** ***(Recommendation to EOFRA, Livestock Recyclers (3), Mortality Collectors/Stock Removal (14), OABA, OMAF and OSMA)*** – nutrient management, greenhouse gases (GHGs) and deadstock disposal will increasingly be problematic for the sheep industry. Producers need to be equipped with management information that lessens environmental impact of sheep production. Specific examples identified by the committee are:
   - Improving nutrient use efficiency and rumen chemistry by use of ionophores and ration management, for example, to reduce environmental impact
   - Practical and environmentally sound deadstock disposal options

3. **National Identification** ***(Recommendation to CSBA, CSF, OMAF, OSMA & PSBO)*** – that all the named parties prepare an implementation plan, including producer awareness and education top facilitate transition to a National Identification system

4. **On-Farm Food Safety** ***(Recommendation to CFIA, CSF, CVMA, OABA, ODSA, OIMP, OMAF & OSMA)*** – major upcoming challenges regarding On-Farm Food Safety (OFFS) where highlighted. The Ontario sheep industry would benefit greatly by implementing OFFS programs, by improving consumer confidence and securing markets. Specific issues that require tech transfer were identified by the committee as follows:
   - The proper use and mixing of medicated feeds
   - Deadstock disposal options
   - Extra-label use of drugs in sheep (esp. dairy) due to the poor availability of pharmaceuticals to veterinarians and farmers for approved use in sheep.
   - Provincial processor quality assurance
   - Milk quality

Obstacles to Completing Recommended Technology Transfer Priorities

The committee identified a number of obstacles to the successful tech transfer of the identified topics these include;

- Lack of dedicated human resources in both public and private sectors
- Lack of funding/investment both in tech transfer and the industry itself
- Inappropriateness of producers teaching producers – this topic was identified as having two sides. One is the scenario where new or expanding producers are a drain on the time and energy of established, innovative producers. It robs the industry of productivity, and the sharing of sophisticated knowledge is not rewarded (ie no payment is made for consultation). The second problem are producers that are still in the 'cottage industry' mode, that are willing to share information, but that information has a quality control concern
- There are no private consultants currently practicing
- There is no specific window for small or new (lifestyle) producers, which detract from efforts to reach commercial-scale producers, and hinders extension to those new operators
- Problems resulting from University of Guelph structure and restructuring
- Geographic issues relating to delivery

Potential Vehicles to Improve the Delivery of Technology Transfer Priorities in Addition to Current Resources

The committee identified a few novel ways to consider in helping overcome these gaps. These included;

- A high-end call centre that is strong in sheep specifics
- Government or industry endorsed consultant program where the early adopting, industry leaders can be compensating for their expertise, while minimizing personal liability
- National Conference hosted in Ontario for Fall 2003 where researchers, extension, agribusiness and farm leaders can meet on a range of topics of mutual interest

Research Issues

The committee resolved that the sheep research objectives and priorities approved by ARIO must be re-visited. This is on account of the fact that several of the sheep research priorities will be difficult or impossible to achieve with the reduction in sheep research facilities that are funded by OMAF at the University of Guelph. The committee will sit again following the submission of this report to develop a new strategic plan outlining revised priorities, as well as an industry plan to attract researchers into the program as well as financial resources to support sheep research.

Notes

Data Sources (State of the Industry)
Statistics Canada
Agriculture and Agri-Food Canada
United States Department of Agriculture
Compiled by Anita O'Brien, OMAF

Acronyms Used

ARIO – Agricultural Research Institute of Ontario
CAHI – Canadian Animal Health Institute
CBA – Canadian Bankers' Association
CFIA – Canadian Food Inspection Agency
CSF – Canadian Sheep Federation
CSBA – Canadian Sheep Breeders' Association
CVMA – Canadian Veterinary Medicine Association
EOFRA – Eastern Ontario Farm Recycling Association
OABP – Ontario Association of Bovine Practitioners
OCA – Ontario Cattlemen's Association
OFA – Ontario Federation of Agriculture
ODSA – Ontario Dairy Sheep Association
OIMP – Ontario Independent Meat Processors
OLAMA – Ontario Livestock Auction Market Association
OMAF – Ontario Ministry of Agriculture & Food
OMNR – Ontario Ministry of Natural Resources
OSMA – Ontario Sheep Marketing Agency
OVC – Ontario Veterinary College

Research and Service Subcommittee – Research Recommendations (2002) (optional submission)

Aquaculture Research Priorities and Recommendations

Recommendation # 1

Issues Addressed: Environmental Issues, Profitability, Regulatory Framework

Target Agencies: Ontario Ministry of the Environment, Ontario Ministry of Natural Resources, Environment Canada, Fisheries and Oceans Canada, Ontario Ministry of Agriculture and Food, University of Guelph

Recommendation: Increase activity in environmental impact research.

Details: Investigate various approaches to quantify environmental impacts of fish farming activities specifically to develop techniques to estimate the impacts on assimilative capacity of various receiving water systems. Assimilative capacity assessments should take into account expected regenerative capabilities of sites, where applicable, using data from actual investigations of decommissioned facilities.

Background: In Ontario, current guidelines governing water quality impacts from aquaculture operations do not address mass loading of nutrients discharged from a production facility in relation to the assimilative capacity of receiving waters. Given the variability existing both in types of production facilities (inland, cage, re-circulation) and their receiving waters (cold, warm, streams, lakes), use of the mass nutrient loading approach to regulate fish farming appears to be the optimal method for protection of the environment while allowing for orderly development of aquaculture. For inland operations, such an approach would end the discrimination currently inherent in the regulation of point source nutrient inputs on watersheds, while much greater non-point source inputs are overlooked. For cage farms, regulation through nutrient loading would offer operational flexibility and the opportunity to progress towards a management model involving site rotation, which would benefit both the environment and production. The need to move forward with an improved regulatory approach is especially urgent for the cage sector, the segment of the industry with the most growth potential. Governments must, however, recognize that the cost of developing such a regulatory approach is well beyond the resources of the industry at its present size. The decision to undertake the necessary research involved would require an acknowledgement by all government agencies that the development of a successful aquaculture sector is desirable and beneficial for Ontario.

Recommendation # 2

Issues Addressed: Profitability, Environmental Issues, Competitiveness

Target Agencies: Ontario Ministry of Agriculture and Food, University of Guelph, Ontario Ministry of Natural Resources

Recommendation: Increase activity in nutrition and bioenergetics research.

Details: Investigate alternative protein sources for salmonid feeds to reduce dependency on expensive fish and soybean meals. Simultaneously, waste production implications of alternate protein sources must be taken into account, considering the potential to decrease phosphorus and nitrogen outputs while avoiding the creation of new problems.

Background: Feed costs in aquaculture constitute up to 60 % of the unit cost of production for raising carnivorous fishes of the salmonid family. Therefore this is the variable that holds the most promise for significantly improving profitability of large, commercial scale rainbow trout farms in Ontario. Lower feed costs per unit of production would raise the relative significance of transportation costs, thus providing a competitive advantage over imports. Additionally, diet reformulation provides an opportunity to reduce nutrient outputs and alleviate environmental concerns.

Recommendation # 3

Issues Addressed: Profitability, Competitiveness, Public Perception

Target Agencies: Ontario Ministry of Agriculture and Food, University of Guelph, Fisheries and Oceans Canada, Environment Canada, National Research Council Canada, Ontario Ministry of Natural Resources

Recommendation: Increase activity in health management and disease research

Details: Determine the pathobiology and effective management of diseases which are of economic significance to fish farming in Ontario, including newly emerging diseases in species which may become commercially important to the industry, as well as the common gill and skin diseases of salmonids. Investigate the efficacy of commonly utilized chemo-therapeutants, the biological dynamics of these compounds in the environment, and their persistence and clearing rates from fish when used prior to harvest. Determine whether alternatives to chemo-therapeutant treatment, such as vaccines and modifications in husbandry practices, may represent more effective means of disease control. Develop new detection and epidemiological techniques for on farm use.

Background: More effective control and detection of economically significant diseases is essential to lowering costs of production. Public awareness of the use of antibiotics and other therapeutants in livestock production is increasing and fish farmers need to

demonstrate the safety of their disease management practices to end consumers. The lack of registered therapeutants is a problem for the industry that may not be readily overcome due to the small market potential that aquaculture presently offers for a therapeutant relative to the large expense involved in obtaining registration approvals. This necessitates the exploration of alternate means of disease treatment and prevention.

Recommendation # 4

Issues Addressed: Competitiveness, Public Perception

Target Agencies: Ontario Ministry of Agriculture and Food, University of Guelph, Fisheries and Oceans Canada

Recommendation: Increase activity in food products and processing technology research

Details: Develop and refine advanced processing and packaging techniques to add value, assure food safety and quality, and extend shelf life in order to increase the marketability of trout products. Utilize consumer testing and sensory evaluation studies to improve our understanding of consumer preferences.

Background: Ontario aquaculture does not offer the variety or refinement of retail products that other red and white meat industries have. Final product forms have been dictated as much by processing machinery availability as by consumer or market preferences. As the industry grows, product diversification will be required to appeal to a broader consumer base.

Recommendation # 5

Issues Addressed: Public Perception

Target Agencies: University of Guelph, Ontario Ministry of Natural Resources, Ontario Ministry of Agriculture and Food

Recommendation: Increase activity in improving welfare of farmed fish

Details: Develop objective methods for assessing the general welfare of farmed fish through quantitative evaluation of their physiological responses to various management practices. Establish husbandry protocols that maximize the health and welfare of farmed fish without sacrificing production performance or profitability for the farm operation.

Background: Objective methods of measuring animal response are needed for evaluation of the effect that current and alternative husbandry practices have on behaviour and stress in aquatic animals. This information will allow fish farmers to develop and adopt optimum culture practices and respond effectively to ethical concerns regarding the holding and husbandry of fish.

Ongoing Priorities

The Aquaculture Research and Services Coordinating Committee would like to emphasize the importance of maintaining currently ongoing activity in the following areas:

Genetics, Breeding, And Reproductive Control Research

Very little is known about the genetic make-up and potential for improvement of performance of the rainbow trout stocks cultured in Ontario, and we are therefore not fully exploiting the genetic potential of our domestic stocks of fish. We need to determine genetic variability, specific parameters, and gene-environment interactions affecting growth performance and disease resistance in rainbow trout, with the aim of improving those stocks. We need to enhance reproductive cycle control and reproductive performance, and work on gene mapping of desirable production traits in existing rainbow trout, Arctic char, and other salmonid stocks.

Nutrition And Bioenergetics Research

Research to reduce the present cost of feeding salmonids through diet optimization, improved feed processing techniques, and feeding strategies must continue, as well as the development of production diets and feeding regimes for alternate species with commercial potential in Ontario.

Economic Analyses, Industry Profile and Marketing Research

The collection of the "Aquastats" database is vital for production management and forecasting of Ontario aquaculture. Successful extension work includes ongoing identification of those management factors that contribute to farm profitability and evaluation of the best methods for enhancing them.

Dairy

Research Recommendations Update

Reproduction

As indicated previously in this report, the conception rate in dairy herds is dropping.

The committee recommends that research be completed on the causes for decreasing conception rates in dairy herds and practical methods to improve reproduction efficiency. Assessment of the optimal days open and length of lactation is also needed, in light of the continuing higher production and different management technology in today's dairy herds.

Pork Research Priorities and Recommendations

5.0 Recommendations Arising From Identified Issues

The Pork Research and Services committee has identified 4 research recommendations from the issues facing the Ontario Pork Industry.

5.1 To Focus Research on Environmental Issues

Background

Concern is growing in Ontario and world wide as to the effect swine production has on the air, water and soil. This will accelerate as the move to larger operations means that the impact from a mistake in storage or spreading of manure is great. There is an urgent need to develop alternative manure management systems to solve the issues of odour, pathogens, and nutrient management associated with manure. Nutrient Management Plans and MDS guidelines have been put together based on the best information available, but additional knowledge will improve these guidelines. Furthermore, society has a growing concern for the welfare of the pigs as well as to the long-term health of the operators of these facilities and these concerns need to be addressed by research into designing safer, healthier, and more comfortable units for both pigs and herdsmen.

Objectives

1. To evaluate current methods of manure storage, processing, and application to determine the environmental impact of swine production and to determine methods of reducing negative effects and maximizing the positive benefits. Alternative manure systems need to be evaluated to determine the technical feasibility, applicability, strengths, weaknesses, economic viability, and environmental impact. Computer models to simulate nutrient flow might be useful in evaluating and determining guidelines.

2. To explore technologies which will reduce the negative impact of swine production through the reduction or balancing of the nutrient content of the feed, the improvement in feed utilization, and/or the manipulation of the microbial flora of the pig's intestine.

3. To focus research into the reduction of odour from swine operations including the assessment of housing systems, manure application, techniques, and storage systems. In addition to developing methods to reduce odours, there is a need for better instrumentation for the assessment of odours.

4. To evaluate the safety of pigs and people. Specifically there is a need to investigate techniques to reduce the health risks associated with manure gases such as hydrogen sulfide particularly at the time of manure removal. Health concerns such as the long-term inhalation of barn dust by farm workers needs to be investigated.

5.2 To Assure Superior Pork Quality and Safety

Background

Food safety can be a highly volatile issue. In recent years, food industries have been destroyed by outbreaks of food poisoning. Competitors are promoting pork products from production systems focused on pathogen monitoring and minimisation of anti-microbial use.

Specific concerns are contamination of food with pathogenic or spoilage micro-organisms or industrial and agricultural chemicals which could result in food poisoning. Research is needed to determine the extent of and the reasons for the various types of contamination and how these can be prevented. Because knowledge about controlling these contamination sources is least developed as it applies to pre-slaughter handling and production, extension efforts directed at developing effective on-farm HACCP programs and strategies is needed. As a control measure to ensure the integrity of pork products and protect both domestic and export markets, development of quick and reliable on-site tests for the detection of microbial agents and chemical contaminants in pork are needed.

A growing area of concern is the possible development of anti-microbial resistant bacteria. Research is needed to study the effects of anti-microbial use as it relates to food safety and develop alternative strategies or systems. Developments in human medicine and possible use of pig-derived transplant parts produces a new area of risk for the development of unidentified and potentially very serious new health risks associated with pork production.

Backfat levels in pork carcasses continue to be reduced through improved genetics, nutrition and management. This has been accompanied by a decrease in intramuscular fat with reductions in flavour, juiciness and to some extent tenderness. Research is needed to determine how we can reduce fatness while maintaining the eating quality of pork. There is also a need to determine ways of altering fat distribution on carcasses to satisfy demands for specific products and to be capable of tailoring genotypes and production systems to these specific demands.

Product consistency for pork products is becoming increasingly critical in meeting consumer demand. Reducing variability in the delivered product will be important in gaining market share for pork products both domestically and in export markets. Research is needed in the area of variability within genotypes as it

relates to meat quality and consistency. There is a need to eliminate odours such as skatole or boar taint and other negative characteristics.

A variety of new alternative feedstuffs, derived from the consumer and food manufacturing sector, are available for swine. The quality, variety and demand for these products has increased dramatically in the past few years. There are risks associated with the use of some of these products, particularly in the area of carcass composition, meat quality and consumer acceptance. These alternative feeds need to be classified with respect to human and animal safety, nutritional value and effect on meat quality. Satisfactory inclusion levels and the additive effects of combinations of flavours and different fatty acids should be evaluated before these products are utilized in swine feeding programs. Consumer satisfaction related to the issue of opportunity feeds is becoming a differentiating factor in the marketing of pork products. Research should be directed toward development of knowledge about sensory characteristics of pork and their adjustment.

PSE (pale, soft, exudative) pork remains a serious problem in the Canadian pork industry. PSE is responsible for direct financial losses domestically and reduced sales internationally. The discovery of the PSS gene and the subsequent efforts to eliminate it from the pork population will not eliminate PSE pork. Other genes associated with poor meat quality need to be identified. In addition, research is still needed on how to reduce the impact of current marketing, transportation and slaughter practices on the development of PSE in pork as well as on the welfare of the pig.

Objectives

1 To focus research in the area of food safety and in particular to develop better techniques to control food borne pathogens and to investigate micro-organisms of swine which may have zoonotic potential.

2. To develop strategies and technology which will reduce antimicrobial drug use. Alternative methods of disease control such as techniques to improve immunity and the use of probiotics should be investigated. Techniques to more effectively monitor drug or chemical residues to ensure product purity are also needed.

3. To improve pork quality by identifying genetic factors associated with flavour and tenderness, by investigating the impact of new opportunity feeds on taste and oxidative stability, and by continuing to develop quantification and control measures for factors in meat that affect quality and consumer acceptance. The elimination of undesirable smell associated with skatole or boar taint needs to continue to be investigated.

4. To continue to develop technology for the prediction of meat quality from measurements in the live animal for genetic selection programs and on carcasses to reward producers and stimulate genetic improvement with regard to meat quality. Research needs to be conducted in order to determine and evaluate the relative importance of the factors responsible for the wide variation in composition of pork carcasses and to develop production systems to produce more uniform carcasses.

5.3 To Improve Production Efficiency for a Continued Competitive and Viable Industry

Background

Ontario has some advantages in pork production. The industry is primarily land-based, allowing producers to use manure as fertilizer to reduce the cost of producing feed. The main area of pig farming is located on land suitable for growing corn and soybeans. There is a large labour pool and a strong infrastructure of feed mills and a strong packing industry. However, the Ontario pig farm tends to have the smallest unit size of any pork producing region in North America and pigs are often produced in out-dated facilities. In order to remain competitive, the Ontario pork producer needs to be highly productive and able to rapidly apply new and innovative technology.

Feed accounts for 60-65% of the total cost of producing a market hog and offers major opportunities for improving profitability. To remain competitive swine diets must be continually updated to keep pace with improvements in animal performance. Technologies such as segregated early weaning and three site production systems are being adopted by the Ontario pork industry and are leading to unprecedented improvements in health status and growth performance. In addition, genetic improvement and growth promotants continue to improve lean tissue growth rates of swine. The combined effects of these advancements is to increase the complexity of predicting the nutrient requirements of swine. There is an immediate need to expand and apply existing swine growth simulation models through basic and applied research and make them available to the industry. Models are the only effective tools to develop the optimum feeding and management strategies for individual pig units. Models can also be used to identify means to reduce the excretion of excessive nutrient intake in pig manure addressing an environmental concern.

Swine producers in Ontario continue to suffer losses due to mycotoxin contamination of corn and wheat. These losses result from feed refusal and disruptions of breeding herds. Recently, significant advances have been made in the control of some mycotoxins. Current research efforts at the University of Guelph merit continued support given the potential negative impact mycotoxins could have on pig performance and financial viability. Research to develop fusarium/mold resistant corn needs to be supported.

Liquid feeding systems are becoming more prevalent in Ontario. Most of the information and research is from Europe and is not applicable to the Ontario situation (differing feedstuffs, genetics, temperatures etc.).

Strategies for reducing the prevalence of disease in swine herds have been employed by many Ontario pork producers. Depopulation and re-population with minimal disease animals, strategic medication to eliminate specific diseases, and all-in/all-out management systems are examples of common techniques that are being used to create a better health status for Ontario pigs. Another important aspect of these strategies is that antibiotic use can be reduced and thus the risk of residues and the development of antibiotic resistance may be reduced.

As a result of these and other changes to the Ontario swine industry, the emphasis placed on infectious disease research needs to be shifted from the treatment and control of traditionally important diseases to studying health security and disease monitoring. There are diseases that are now emerging as important problems under these management systems. These diseases include Porcine Reproduction and Respiratory Syndrome (PRRS), Streptococcus meningitis, Mycoplasma infections, and Glasser's Disease. Recently, post-weaning colibacillosis has become a significant problem and requires investigation. New diseases continue to arise. Post-weaning Multi-systemic Wasting Syndrome (PMWS) has been identified as a possible cause of economic loss in Ontario nurseries. A growing worry is that local diagnostic labs have been closed and many diagnostic samples are sent out of province. There is a need for some type of monitoring program to act as an early warning system to detect new disease problems as they arise and possibly provide benchmark information for the industry.

There has been a rapid acceptance of artificial insemination in the Ontario swine industry resulting in an increased need for research in this emerging technology. A trend toward earlier weaning ages has caused a need to study the effects of short lactation length on reproductive performance.

Another development in the industry is to all-in/all-out management of nurseries and grower-finisher facilities. This has led to the use of batch farrowing on certain farms. There is a need to examine techniques for synchronizing estrus, possibly through hormone manipulation, to assist producers using batch farrowing systems, but also to help maintain pig flow on weekly farrowing units as well.

The economic importance of predictable and controlled reproductive performance can be measured in pigs produced and physical resource utilization. The potential for improvement in litter size, farrowing rate, and early puberty is great.

Biotechnology is the most powerful emerging technology of our time. Decoding the genetic information that drives life processes in all living things -microbes, plants, animals (pigs), humans -unlocks the door to unparalleled (economic)

opportunities. It is important that the Ontario pork industry continues to be involved in the area of biotechnology in order to be in a position to initiate new technologies as they are developed.

Objectives

1. To develop innovative feeding technologies and improved nutritional programs in order to make Ontario pork production more efficient. Liquid feeding systems need to be evaluated under Ontario conditions. There is a need to evaluate the nutrient requirements of swine using a factorial (modelling) approach. Models could be used to determine the strategy needed to feed a specific group of pigs to their genetic and environmental potential as economically as possible.

   In addition, work needs to continue to reduce the adverse effects of mycotoxins on swine and to develop fusarium resistant corn varieties.

2. To investigate the impact of disease and methods to control or eradicate economically significant diseases. In particular, diseases that cause reduced growth rates and weight gain variability need to be studied. Research needs to continue to improve our understanding of the pathogenesis, epidemiology, and control strategies of economically important diseases. Emphasis needs to be placed on monitoring and biosecurity.

3. To improve reproductive performance and piglet survival by investigating boar physiology and factors associated with semen quality, by investigating factors associated with embryo viability and exploring techniques to improve embryo transfer, and by investigating physiological, environmental, and disease factors associated with parturition and neonatal viability including lactation failure. Artificial insemination and synchronization of the sow's estrus cycle are important areas of investigation.

4. To apply transgenic methodology for the introduction of genetic traits into pigs to modify specific characteristics and to explore other opportunities in genome research.

5.4 To Improve Animal Well-being

Background

Behavioural problems impose constraints on productivity. Problems include inadequate nursing behaviour leading to starvation of suckling piglets, inadequate feed intake of newly weaned pigs, and poor mating performance of boars. In addition, there are detrimental "vices" such as tail-biting, ear-biting, and flank

sucking which cause serious injury. Aversive behaviour such as bullying and fighting make group housing of sows difficult and regrouping of grower-finisher pigs problematic. A better understanding of behaviour and the causes of "vices" would be of value.

Modern housing and management often raises welfare concerns by the general public. There is a need for better methods to determine when animals are stressed and better methods of determining whether a housing system is detrimental in terms of animal well-being or not. There have been restrictions placed on pig farmers in Europe that have been based more on emotion than on science. Nevertheless, there needs to be work done to develop more "welfare-friendly" systems that truly improve conditions for pigs as well as satisfy public concerns. A significant concern is the handling of crippled or unthrifty animals which need to be humanely and promptly treated or euthanized. At present, there are few satisfactory options for the dealing with these animals. Likewise, the transport and slaughter of pigs creates some welfare concerns and needs further investigation.

Objectives

1. To better understand the social and aggressive behaviour of swine in order to reduce detrimental effects and design more appropriate housing/management systems to minimize behavioural problems and reduce stress including stress of transport and slaughter. In addition, better methods of measuring stress, pain, or discomfort need to be developed and applied in solving this problem.

2. To investigate methods of euthanasia so that crippled or sick animals can be killed in a prompt and humane manner.

3. To identify social and environmental factors associated with vices such as tail-biting and other forms of cannibalism as well as inappropriate dunging/urinating patterns and to devise means to minimize these problems.

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Cindy Hubble	R.R. #3 Stirling, Ontario K0K 3E0 Tel: 613-395-2602 E-mail: dreamweaver@blvl.igs.net	CBGA (Meat)	2004
Keith Leonard	R.R. #3 Tweed, Ontario K0K 3J0 Tel: 613-478-1312 Fax: 613-478-1312 E-mail: clareviewfarm@aol.com	OGBA (Meat)	2004
Brenda Norris	Ontario Ministry of Agriculture and Food 1 Stone Road West Guelph, Ontario N1G 4Y2 Tel: 519-825-4684 E-mail: brenda.norris@omaf.gov.on.ca	OMAF Dairy Food Safety Program	2005
Garry Claassen	R.R. #2 Teeswater, Ontario N0G 2S0 Tel: 519-357-4422 Fax: 519-357-4544 E-mail: claassen@wightman.ca	Dairy Producer	2005
Bill Alexander	R.R. #1 Norval, Ontario L0P 1K0 Tel: 905-877-6462 Fax: 905-877-0716		2004
Deirdre Armstrong	R.R. #5 Mount Forest, Ontario N0G 2L0 Tel: 519-323-2083 E-mail: dja@freespace.net	Ontario Goat Milk Producers' Association Secretary	2001

Pork Subcommittee Membership

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Poultry

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Turkey Subcommittee Membership

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Paul Leatherbarrow Ontario Turkey Producers' Marketing Board Representative	Dr. Helen Wojcinski Hybrid Turkeys Kitchener, Ontario Primary Breeder Representative
Dr. Bruce Hunter Department of Pathobiology OVC, U of G Research Representative	Mr. Ken Cassidy Maple Leaf Poultry New Hamburg, Ontario Processor Representative
Dr. Jim Blackman Shur – Gain Research 150 Research Lane Geulph, Ontario Feed Industry Representative	Dr. Emily Martin Animal Health Laboratory Guelph, Ontario University of Guelph Representative
Dr. Lloyd Weber LEL Farms Guelph, Ontario Poultry Veterinarian Representative	

Sheep Subcommittee Membership

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Dr. John Cant	Dept. of Animal & Poultry Science, OAC University of Guelph	(519) 824-4120 ext. 6222	Researcher, U of G	2004
Mr. Fred Baker	R.R. #3 Mountain, Ontario K1A 0T6	(613) 989-5352	OSMA, CSF	2003
Mr. John Cuthbert	Canadian Co-operative Woolgrowers (CCWG) R.R. #1 Cookstown, Ontario L0L 1L0	(705) 458-4800	CCWG	2003
Mr. John Steele	R.R. #4 Norwood, Ontario K0L 2V0	(705) 696-1491	Producer	2002
Ms. Delma Kennedy (*Chair – on leave*)	OMAF 3rd Floor N.E. – ARD 1 Stone Road West Guelph, Ontario N1G 4Y2	(519) 826-3290	OMAF – Sheep Flock Improvement Program	2003
Ms. Cathy Lennon	OSMA 130 Malcolm Road Guelph, Ontario N1K 1B1	(519) 836-0043	OSMA General Manager	2002
Dr. John Martin	OMAF Wellington Place, R.R. #1 Fergus, Ontario N1M 2W3	(519) 846-3420	OMAF – Veterinary extension	2002
Mr. Bill McCutcheon	R.R. #2 Grand Valley, Ontario L0N 1G0	(519) 928-9626	Canadian Sheep Breeders Association	2002
Ms. Cecelia Curtis	C/0 Floradale Feed Mill Ltd. Floradale, Ontario N0B 1V0	1-800-265-6126	Feed Industry	2003
Ms. Elizabeth Bzikot	Best Boar & Baa Farm R.R. #1 Conn, Ontario N0G 1N0	(519) 848-5694	Dairy Sheep Producers	2002
Ms. Anita O'Brien	OMAF, Box 2004 ORC Building Kemptville, Ontario K0G 1J0	(613) 258-8299	OMAF – extension	2003
Mr. Ted Skinner	2910 Conc 7, R.R. #5 Bowmanville, Ontario L1C 3K7	(905) 263-2102	Producer	2002
Mr. John Hemstead	354 Line 8 S., R.R. #2 Oro Station, Ontario L0L 2E0		OSMA Chair	2002
Dr. Peter Rich			Practicing Veterinarian	2004
Mr. Christoph Wand *Interim Chair 2002 Report Author*	OMAF, Hwy. 59N, Box 666 Woodstock, Ontario N4S 7Z5	(519) 537-8422	OMAF – extension	2002

Table 7 - Per Capita Consumption of Selected Foods, Canada, 1991-2001

Red Meats, Poultry Meat and Eggs

Type	Units	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Beef:												
- Carcass weight basis	kg	33.3	32.4	31.1	31.7	31.7	31.4	31.4	31.8	32.5	32.0	30.7
- Retail weight basis	kg	24.3	23.6	22.7	23.1	23.2	22.9	22.9	23.3	23.7	23.4	22.4
Veal [a]	kg	1.5	1.5	1.4	1.3	1.4	1.3	1.4	1.3	1.3	1.3	1.2
Mutton and lamb [a]	kg	0.9	0.8	0.9	0.8	0.8	0.8	0.7	0.8	0.8	0.9	1.0
Pork:												
- Carcass weight basis	kg	25.9	28.4	27.6	28.4	27.8	25.9	25.4	28.6	30.1	28.6	28.9
- Retail weight basis	kg	19.7	21.6	21.0	21.6	21.1	19.7	19.3	21.7	22.9	21.8	22.0
Offal	kg	1.7	1.5	1.1	1.5	1.4	1.3	1.2	1.4	1.7	1.0	1.1
Total red meats [a]	**kg**	**63.2**	**64.5**	**62.0**	**63.7**	**63.0**	**60.7**	**60.0**	**63.9**	**66.4**	**63.8**	**62.9**
Stewing hen and chicken	kg	23.8	24.3	24.8	26.4	26.2	26.6	27.5	28.2	29.6	30.9	32.0
Turkey	kg	4.5	4.6	4.4	4.4	4.3	4.1	4.2	4.3	4.2	4.3	4.2
Total poultry meats [b]	**kg**	**28.3**	**28.8**	**29.1**	**30.8**	**30.5**	**30.7**	**31.7**	**32.5**	**33.8**	**35.2**	**36.2**
Eggs	dozens	15.0	14.6	14.5	14.5	14.4	15.0	15.1	15.2	15.3	15.7	16.0

a Carcass weight basis.
b Eviscerated weight. Excludes goose and duck meat.
Sources: Statistics Canada, Catalogue No. 32-229, and 32-230.

Dairy Products and Margarine

Type	Units	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Cottage cheese	kg	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7
Creamery butter	kg	3.0	2.8	2.9	2.9	2.8	2.9	2.6	2.9	2.8	2.7	2.7
Skim milk powder	kg	1.1	1.1	1.1	1.1	0.9	1.3	1.0	1.3	1.5	1.1	1.6
Whey powder	kg	0.9	0.8	1.0	1.0	0.9	1.1	0.8	0.7	0.4	0.9	0.8
Evaporated milk	L	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0
Cheddar cheese as such [a]	kg	3.1	3.1	3.0	3.2	3.2	3.1	3.2	3.2	3.3	3.2	3.0
Process cheese	kg	2.8	2.8	2.7	2.8	2.7	2.6	2.4	2.2	2.4	2.4	2.5
Other cheese as such [ab]	kg	5.3	5.4	5.5	5.6	5.6	5.7	6.5	6.3	6.2	6.3	6.1
Total Cheese	**kg**	**11.2**	**11.3**	**11.2**	**11.5**	**11.6**	**11.3**	**12.1**	**11.7**	**11.9**	**11.8**	**11.6**
Yogurt	L	3.0	2.9	3.0	3.1	3.0	3.2	3.2	3.5	4.0	4.6	4.9
Sour cream	L	1.0	1.0	1.0	1.0	0.9	0.9	1.0	1.1	1.2	1.3	1.3
Ice cream	L	10.7	10.0	10.9	11.7	11.4	10.9	10.3	10.2	10.0	8.6	9.2
Margarine	L	5.6	5.2	4.9	4.3	5.1	5.3	5.4	5.4	5.2	5.0	4.9

a Not including cheddar and other cheese used in process cheese.
b Per capita consumption of whey and skim milk cheese is included in this category.
Source: Statistics Canada, Catalogue No. 32-229, and 32-230.